

**REEDY RACE OF CHAMPIONS—DOWN AND DIRTY!**

# Radio Control **CAR ACTION**

THE WORLD'S PREMIER R/C CAR MAGAZINE

47380

MAY 1992

## TOP 100

**ACCESSORIES • DRIVERS  
CARS • READERS' RIDES  
HOP-UPS • TRACKS**

## FELINE FRENZY!

### SCHUMACHER'S COUGAR II

## HOW TO INSTALL RADIO GEAR

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# Radio Control CAR ACTION

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ON THE COVER: center—Tamiya's new Super Astute. (Photo by John Huber; body by Richard Muise.) Lower right—Joel Johnson's RC12LW and Trinity's Championship Edition motor. (Photo by Yamil Sued.)

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STREET RACING



# EDITORIAL

by FRANK MASI

## RACER OF THE MONTH

**W**E'RE FREQUENTLY asked, "Why don't you feature the little guys—not just the sponsored champs?" We understand that many of you don't have the resources to equip a car with all the latest hardware. We also know that you don't need loads of cash to be competitive, whether you run in a local sandlot or at the ROAR regionals. You only need knowledge of what's essential and what isn't.

R/C enthusiasts, especially beginners, are constantly bombarded by misinformation. Most of it comes from fellow R/Cers who, for whatever



*Car Action and Sanyo proudly sponsored this year's Reedy International Race of Champions. (All the hottest drivers in the world were there!) Here, Car Action Executive Editor Frank Masi and Sanyo's Patricia Takeda have just presented Rick Hohwart with the 1st-place trophy.*

reason, like to discourage others or who need to justify the exorbitant sums of dough they've spent on the hobby. From what you've written in your letters, many of you think that spending a lot of money will enable you to win trophies. We want to do something that should have been done long ago: dispel this myth!

Chris Chianelli's new column, "Spending Smart," will begin in the July issue. In it, Chris will feature racers who spend their

money wisely and still bring home the trophies week after week. We hope that you'll learn things from them that will enable you to be successful, too.

Whether you run in the backyard or you've competed in the Worlds, if you're a racer who gets the job done (and has a lot of fun!) without spending loads o' cash, then we'd like to hear from you. Send a letter describing yourself and your equipment and listing your R/C accomplishments (don't forget black-and-white photos of yourself and your ride!) to: "Spending Smart," c/o R/C Car Action, 251 Danbury Rd., Wilton, CT 06897.

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# LETTERS

**WRITE TO US!** We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

## THE OTHER SIDE OF THE STORY

Regarding the scoop on Reedy Tru-Stock/ROAR '91 stock motors and the "short-stack" armature that appeared in the March edition of "Inside Scoop," I'd like to present the following facts.

All Yokomo "Reedy" motors imported with the stamp "ROAR '91" fully comply with ROAR specifications.

The "short-stack" version was devel-

oped according to ROAR rules and was in full compliance with the ROAR specifications at that time. In the final stages of development, ROAR informed us of an addition to the rule that specified a wire length. This [motor] was never put into production, let alone imported. I'm not sure how these rumors began, but Associated/Yokomo/Reedy make a point of following and cooperating with ROAR rules. As soon as we were notified of the alteration in the rules, we stopped developing this particular motor. Only six prototype samples were produced, and the motor was never offered for sale. As a matter of fact, development had never reached the point of submittal to ROAR.

Further efforts were spent on the devel-

opment of another motor using short-stack technology. Such a motor has since been developed, and it complies with the ROAR '91 stock-motor specifications, including minimum wire length. This motor is in the final stages of development, and it has been submitted to ROAR along with specifications showing full compliance with the present ROAR rules.

We wrote to ROAR suggesting that the rules be amended further to limit the minimum total lamination length (thus filling the loophole) and asking that the length of the wire determined by the new rule be reconsidered. To date, we've received no reply.

A short-stack '91 ROAR-legal motor with a wire that's shorter than ROAR

# ZIP PAK™

## Professional Power for Pennies...

It has been said the human hand is better than a computer at assembling battery packs. Don't believe it! Computers don't have bad days. They don't break up with their girlfriends and they don't have headaches. People do. That's why they don't always do the same job the same way twice. They're only human.

That's why Trinity uses an exclusive, computer-controlled, automated assembly system for their Zip Pak. Reliability and consistency are programmed in and never vary.

This automation is combined with the very finest materials. The cells are Sanyo KR1300SC (1300mAh) and there has never been a world champion that didn't run Sanyos. They've never lost! All tabs are pure nickel and as short as possible to minimize resistance. Each is double welded, and all wires are pure copper with silicon insulation. The entire assembly is pressed into a precision fitted tube which protects it from the rough and tumble world of racing.

As the bare, assembled pack nears completion, it is connected to an instrumented quality control panel which measures all facets of the pack's performance. Only then is the Zip Pak label applied.

The result is the lowest cost, highest quality sport pack available.

**Buy several as back-up spares. Never be short of power.**

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specified was neither produced nor submitted to ROAR for consideration by Yokomo or Reedy Modifieds, although it would have complied with ROAR rules at that time.

Reedy Modifieds has always played by and followed the rules through the years. We have built our reputation on that, as well as on our wins on the track. We'd like all the racers using our products to be reassured that we'll continue to do this in the future.

MIKE REEDY  
Reedy Modifieds

## PROTECT YOURSELF

I just finished reading Richard Muise's

article on painting Lexan bodies (September '91). It's another of your magazine's traditionally fine articles, but there was one thing missing: it made no mention of wearing protective gear, i.e., a mask. In fact, none of your articles mention the precautions you should take when working with paints, flammable solvents, or motor cleaners, and this disturbs me.

When you use an airbrush or a spray can, not all the particles stay on the surface. Much of what you *don't* see ends up in the atmosphere and enters your lungs and your central nervous system, where it can eventually cause brain damage and lung failure. Motor sprays contain solvents that can get into your bloodstream easily and cause permanent liver damage.

No one seems to pay attention to the phrase, "Use with adequate ventilation." I never did. Well, unless you paint in a wind tunnel, you have to protect yourself. I never thought about this stuff until I went to design school and started meeting illustrators, designers and model makers with leukemia, lung cancer and extensive nerve damage. Believe me, you start to listen fast!

Protective gear is also relatively cheap. 3M makes a dual-cartridge respirator for less than \$35. (Even a particle mask is better than nothing.) To keep the motor spray off your hands ("no skin contact" means *no skin contact*, even fingertips!), you can buy latex surgical gloves at

(Continued on page 10)

# Winning by Design

## The TRINITY Championship Series™

Trinity's Championship series of motors is well named. The 1991 record books clearly show the Championship Series has been the hands down winner in all types of modified racing.

1991 NORRCA 4wd Dirt Oval.....	National Champion
1991 ROAR 1/10th On-Road.....	National Champion
1991 ROAR 2wd Dirt Oval.....	National Champion
1991 ROAR 2wd Off-Road.....	National Champion
1991 ROAR Monster Truck.....	National Champion
1991 Cleveland Indoor.....	National Champion

Championship motors are fast and are the first specifically designed to use Sanyo's new 1700SCRC and Panasonic's P170 SCR batteries.

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RC1779	Speed Metal™	(12T, Trpl)	\$80
RC1780	Flash Point™	(13T, Sngl)	\$80
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RC1782	Armageddon™	(15T, Quad)	\$80
RC1783	The Classic™	(16T, Quint)	\$80
RC1708	Joel Magic Johnson®	(17T, Trpl)	\$80

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# LETTERS

medical-supply companies and most pharmacies. (You can also use gas mitts or sandwich bags if you're in a jam.)

I believe this magazine has a responsibility to mention such precautions, even if they're assumed to be common knowledge. Save your central nervous system for the bug race; don't blow it on a \$5 can of paint!

CHRIS GORIS  
Glendale, CA

*Thanks, Chris; we appreciate your writing to point that out, and from now on, we guarantee that we'll always include a warning in every painting article. And thanks, too, for clearing up the mystery about Chianelli; we always thought the '60s were bad for him; now we realize it's all the result of modeling.*

LA

### PROPO PROBLEM

I've been involved in R/C for about two years. I have an RC10T, and I want a KO Propo EX-1 to go with it. It sounds like a great controller, but only a couple of companies that advertise in your magazine carry it, and my local hobby shop said it wasn't being distributed anymore. Why is this? I always see great drivers using (and winning with) the EX-1. If I get the EX-1, is there a place in the U.S. I could send it to, if I have a problem with it? Would I be better off with a radio from Futaba or Airtronics? Your magazine is great!

CHAD PIALA  
Waukesha, WI

*Chad, the KO Propo EX-1 that you're looking for is no longer manufactured, but a new, updated EX-1 has now hit the U.S. This EX-1 has a new ergonomic design and broadcasts on FM instead of AM. The entire line of KO Propo radios and servos is imported and serviced through Hobby Shack. Contact them at 10725 Ellis Ave., Fountain Valley, CA 92728; (714) 964-0827.*

AS

### ON THE ROAD AGAIN

Hey, people! I've been into R/C cars for four years. My first and only "toy" is a Blackfoot. It's equipped with a Monster Mash motor and a Thorp dogbone diff. It's in pieces under my desk right now, so I ordered a bunch of crap to get it on the road again. Hopefully, it will work.

Ever since I got my Mash, I've heard about modified motor adjustments, and I want to know what they are and how to do them. I hate to say it, but the speed bug got to me, and I want more speed. Don't tell me to go to a hobby shop. The closest one is 30 miles away and a long-distance phone call. This is the best magazine I read, no matter what my girlfriend, parents, or teachers say. Keep on rockin', people-type persons.

NAME?  
planet?

*Hey people-type person, I hope the "crap" you ordered will get you running again. As to motor adjustments, you must be referring to timing adjustments. Timing is the relationship of the brush hoods to the motor magnets, and it's measured in degrees. By loosening the two screws on the endbell of a modified motor, you can rotate it to alter its performance. I don't recommend that you fiddle with this setting unless you understand the effect it will have. But if you do, mark the endbell's orientation before you change anything so you can return to the original setting if you need to. We plan to feature an in-depth modified-motor article, so keep your eyes peeled.*

JH

(Continued on page 94)

### FYI

NORRCA would like to advise our readers that there were two errors in the first printing of its '92 rules.

● The proper weight for Off-Road Trucks in all classes is 3 pounds, 12 ounces.

● Batteries with an mAh rating higher than 1400 are only legal in an Expert Modified Class, regardless of the scale.



# INSIDE SCOOP

by CHRIS CHIANELLI



**A**n Alleged Editor's work is never done, especially if he takes orders directly from the exalted one himself, Louis "El Commandante" DeFrancesco, our group publisher and "partner" of the R/C waters. I'm so busy that I have very little time to run much of the stuff I write about.

There's a payoff though: I get all the late-breaking news before those other "fish-wrap" rags—revenge is mine! Anyway, I work for El Commandante, and we all work for you. So many scoops, so little time....



## AGENT 002 (FEARLESS WORM HUNTER)

Tomy's TRX-002 digital/proportional 4-channel robot has dual microsensors, dual-drive motors and a flashlight. Japanese fishermen have been successfully using "Agent 002" to hunt for night-crawlers while the fishermen catch some sleep. For the sake of American fisherman and lazy blue jays, I'll contact Tomy to inquire about availability, but the people in the East Coast office haven't been very helpful in the past.



**NORRCA 2WD Off-Road Champ Rick Vehlow has left Associated to race the new 2WD TRX-1 and the new LS version of the Blue Eagle truck for Team "Texas" (i.e., Traxxas). Having missed first place in the IFMAR World Champs by just one point (he finished behind Masami), Rick can, indeed, be called a world-class driver. When asked why he switched teams, he responded, "I'm excited about the Traxxas racing development program. The products are impressive, and I feel that we have the ability to win at world and national levels." Congratulations, Traxxas. And good luck to you, V-Man!**

**TRAXXAS  
STEALS  
FROM  
ASSOCIATED**

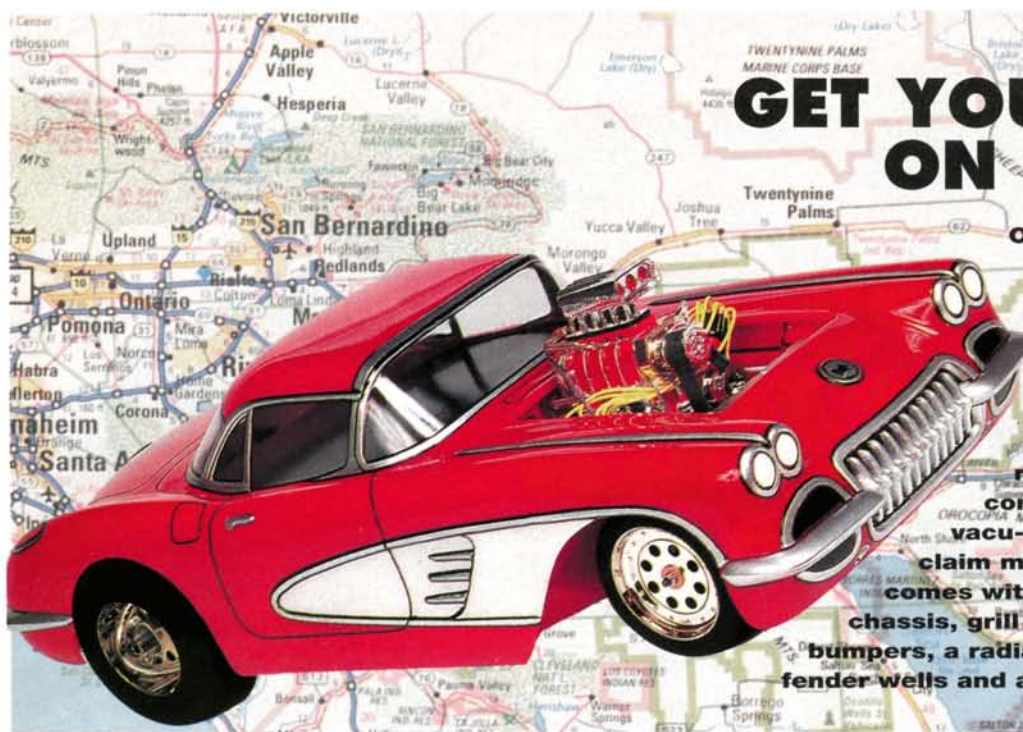


## FOOT-LONG FLIER



Do you remember the High-Tech Attack gyro saucer that we featured in the July '91 "Inside Scoop"? Well, Keyence, maker of the saucer, has introduced the 4-channel, 11-inch-long (from nose to tail-rotor shaft) Revolutor H-610. It has the same micro-concept design as the saucer, and it features twin gyros that are connected directly to its micro-electronic circuit board. The H-610 comes ready to fly, complete with a transmitter, and it has reportedly made dozens of successful night-crawler rescue missions in Japan. There's no word about availability at this time.





# GET YOUR KIX ON ROUTE 66

On the heels of the very popular Hemi Coupe comes this new addition to Parma's series of classic scale models—the '58 Hemi Vette. Parma maintains that this car's body is the most realistic ever made. It consists of five pieces, each vacu-formed separately, so this claim may well be true. The kit comes with a Hemi engine, a rolling chassis, grill pieces, front and rear bumpers, a radiator, a chassis underbody, fender wells and a muffler.



Hobby Dynamics has introduced its Terminator line of matched Sanyo 1400mAh cells and assembled packs. The people at Hobby Dynamics claim that the Team Terminator cells are matched using a process that's second to none—hence the name Killer Cells. The company plans to offer many Terminator “performance products,” including stock and modified tuning kits. Watch out for them Sarah Conner.



## TUNDRA RUNNER

The electric version of the super-scale 4WD Toyota 4Runner has reached the American shores. For this model, Kyosho replicated (in miniature, of course) the suspension and chassis used on the full-size car. According to *Car Action* Associate Editor John “John-Boy Walton” Huber, the 4Runner performs well, and it has a low-drag drive train, especially when ball bearings are used. Look for John-Boy’s “Track Report” on this vehicle in the next issue.





## GENEVA GASSER

Here's the European 1/8-scale 2WD Champion, Didier Boulmier of Geneva, Switzerland, sporting a *Car Action* T-shirt. He runs the Corsair, which is manufactured by the Swiss company Micro-Racing. At this point, I know very little about the car or, for that matter, the company, except that a 4WD version is available and that Micro-Racing is looking for a U.S. distributor. Anyone who's interested can contact the company at Fax: 011-41-22-783-0909.

## Nitro-Bird

Kyosho's new Ford Thunderbird is based on the ZR-1 chassis, and it uses a CZ-R .12 glow-fuel engine. The T-Bird comes with foam tires; a NASCAR decal set; a quick-fill, flip-top fuel tank; and a pull-start engine with an assembled drive-train unit attached to it.



What were the people at Tamiya thinking when they came up with the name for their new, ready-to-run, entry-level car?! Rookie Rabbit?! Give me a

## WHO KILLED ROOKIE RABBIT?

break. It sounds like the favored contestant on Pee Wee Herman's Saturday morning Race-O-Rama. Can't you hear Pee Wee's obnoxious, squeaky voice as he comments on the race? "Here comes that tenacious little tyke, Rookie Rabbit, huffin' and a-puffin' down the final...and it's Rookie Rabbit by a tail! Lets give him a big hand, boys and girls!" The Rookie *does*, however, look like a very resilient, beginner's car...or maybe I should say, car-toon.

Cecil Schumacher isn't the kind of person who can leave well enough alone, so he *had* to make the Pro Cat even better. The new Special Edition Pro Cat features Aerodisc 2.2-inch wheels and mini-pin spike tires, new Vari Shocks, a slipper clutch, a rear Super diff and a rear anti-roll bar. The Pro Cat SE is available now.



## CECIL SHARPENED ITS CLAWS



# TROUBLESHOOTING

by FRANK MASI

Illustrations by GERRY YARRISH

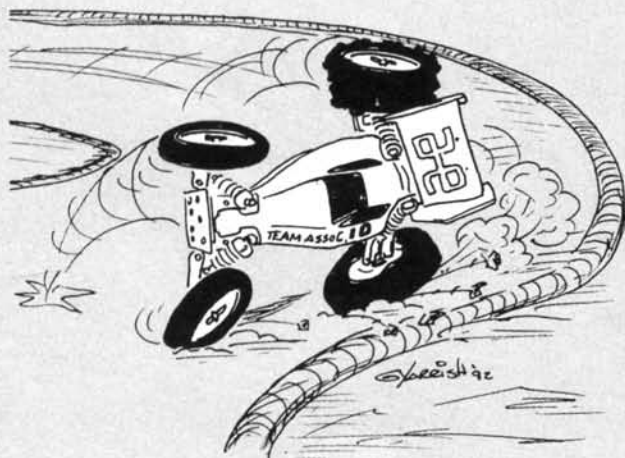
*If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.*

## TOP-HEAVY '10

I bought my Associated RC10 about two months ago. It ran well for a week but, after that, whenever I drove it at top speed through sharp turns it tipped over. I've stopped driving it at top speed in sharp turns, but it still has this problem. I thought I might try using the special front wheels and tires that come with the RC10T. I use a 2PBKA Magnum Junior radio and a Futaba MC112B controller. Please help!

**Chris Burkhardt**  
Baldwinsville, NY

*I don't think that using the RC10T's narrow front wheels and tires will solve your problem. Although you didn't say whether you run on a dirt or an asphalt track, I'll assume that you run on dirt. It sounds as if your RC10 has a bad case of traction roll. Your car's outside tires have too much traction in the turns. This prevents the car from sliding and, thus, from slowing down. There isn't a chassis designed that can take a corner at full speed. You have to slow it down (by sliding, if it's an off-road car, or by braking, if it's an on-road car) or, like your car, it will traction roll. Try using tires with less bite, or give the car 2 or 3 degrees of negative camber, i.e., set it up so that the tops of the front and rear tires lean inward.*



## WALKIN' THE DOG(BONE)

I've been driving R/C cars for about eight years. (I started with a Fox, and I still have it.) Recently, I bought an RC10 from a friend for \$30. So far, I've added a Novak T-4, a Joel Johnson Part 2 stock motor and a Thorp 48-pitch gear set. During acceleration, the dogbone on the diff side pops out unless the spring collar is slid up so far on the shock that the car's rear end drags on the ground. When I race on parking lots, the car bottoms-out. Although the Thorp gears helped for a while, they didn't completely solve the problem. Can you help me?

**Chris Rocco**  
Port Reading, NJ

*The dogbone probably pops out because the stub-axle spring is missing. Because you purchased your RC10 secondhand, and therefore didn't assemble it, there was no way for you to know that such a spring even existed. During assembly, just before you install the dogbone, you put a small spring into the stub axle. The spring will push the dogbone against the tranny's outdrive gear, allowing the dogbone to slide in and out of the outdrive and the stub axle. It will also prevent the dogbone from sliding too far into the axle and falling out of the outdrive. Associated offers the springs you need (part no. 6372 dogbone springs and spacers), and they're easy to install. You should replace the spring on the other side of the car, too. Also, be sure to install the small, white, nylon spacers in the transmission's outdrive gears; they prevent the dogbones from being forced too far into the outdrives.*



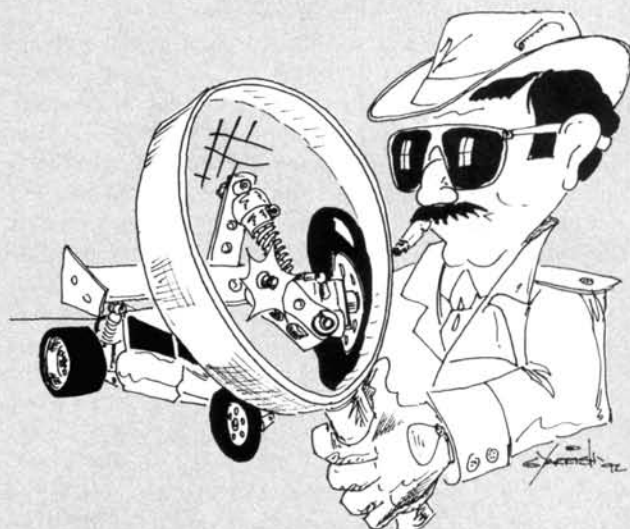
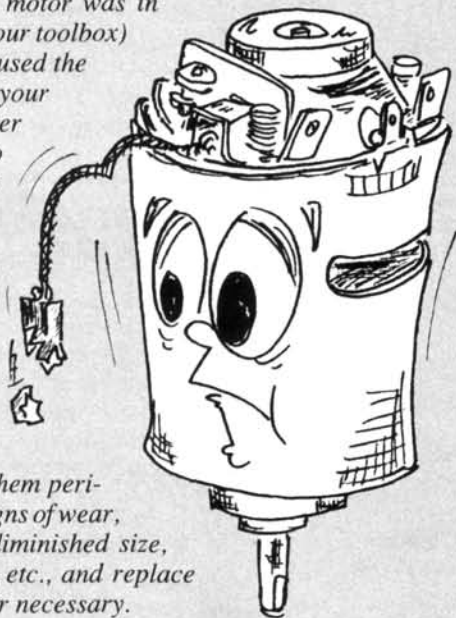
## BRUSH WITH DISASTER!

Recently, while making some practice runs with my car, I noticed a glitching problem with the throttle and the steering. I soldered a capacitor to the lead that runs from my speed controller to the motor, hoping that this would solve the problem. I set out on another run, but I had the same problem. I removed the motor and sprayed it thoroughly with motor spray, but this didn't help. I removed the motor and the brushes and discovered that one of them had broken in two and the other had a slight chip in it. What caused this? Overheating or spraying the motor without removing the brushes? (The brushes came with my Trinity Slot Machine.)

Steve Levi  
Yucca Valley, CA

*Sometimes, when you run an R/C car outdoors, rocks and other debris are "sucked" into the motor. If these particles become lodged in the motor, they can work their way toward the commutator and possibly damage the brushes and the commutator when the motor rotates. To solve this, install a motor-endbell dust cover. (Be sure that the one you use is made for the motors in R/C cars.) Also, the cover must allow the motor to "breathe," because the air that usually circulates through the motor carries away heat.*

*Also, an exceptional shock or jolt while the motor was in your car (or your toolbox) could have caused the "demise" of your brushes. Either way, be sure to replace the damaged brushes and run the motor for a few minutes at 3 or 4 volts without a load to seat them. Check them periodically for signs of wear, e.g., greatly diminished size, discoloration, etc., and replace them whenever necessary.*



## THE CASE OF THE MISSING E-CLIPS

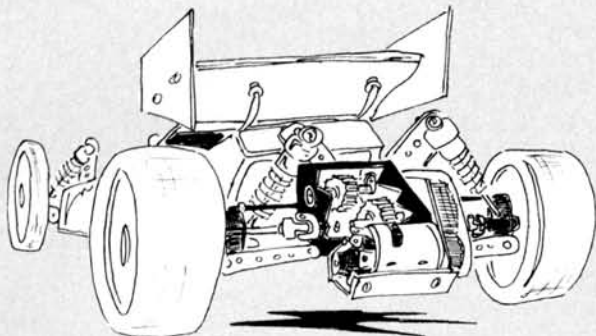
Your magazine is the best, and I pick up an issue as often as possible. I'm a truck driver, so I don't have a lot of time to read or play with my car. Still, I hope to race this summer. I own a Team Losi JR-X2 with Airtronics radio gear, a Novak T-4 ESC and a Speedworks Joel Johnson stock motor. I keep losing the E-clips on the front end, and this has really got on my nerves!! Because of this problem, I've broken five (yes, five) sets of A-arms. (I use Losi's swept arms and an RPM 10-degree bulkhead.) I've been trying to think of something I could use in place of the shafts and E-clips, but I really don't want to modify my car. Can you help me? Thank you very much, and keep up the good work.

Douglas Vance  
Cincinnati, OH

*Losing E-clips is definitely frustrating. I've had the same problem with many of my off-road cars. The inner hinge pins, i.e., those used to attach the arms to the front bulkhead, are slightly longer than they need to be. This causes the E-clips nearest the rear of the car to drag on the ground whenever the car's front end bottoms-out (a frequent occurrence in off-road). As a result, the E-clips are often torn off the hinge pins.*

*To solve this, put washers (or other suitable spacers) between the E-clips nearest the front and the A-arm. This will keep the "excess" portion of the hinge-pin toward the front of the arm and prevent your E-clips from being dragged through the dirt.*





## BEAT BUSHINGS

I'm having trouble with the gear case on my Kyosho Big Boss. It's powered by an 8.4V battery pack and a Speedworks Monster Mash motor. (I bought the truck about two years ago, and I ran it for a year and a half with a stock motor before I bought the Monster Mash.) When I accelerate, the gear slips a little, but it still reaches top speed. As soon as I hit a bump, though, it makes a loud clicking noise. I'm positive the dogbones are fine, so it must be the gear case. I've taken it apart about 20 times, but I can't find anything wrong. Until I started having this problem, my Big Boss was almost trouble-free. If possible, I'd like to avoid buying a new gear case.

**Rob King**  
Oakville, Ontario, Canada

Normally, I'd tell you that, owing to the horsepower generated by the Monster Mash motor and seven cells, the transmission gears are probably stripped and need to be replaced. Since you've taken the tranny apart and found everything to be in order, however, it must be something else. This leads me to one conclusion—worn bushings! The bushings in your transmission keep the gears aligned perfectly with one another. When the bushings wear out, the gears tend to be pushed away from one another under heavy loads, e.g., acceleration or landings after jumps. You can buy new bushings or, if your wallet allows, replace them with ball bearings, which will improve your car's performance and increase its durability and run times. While you have the tranny apart, you might as well replace the gears. They're relatively inexpensive, and yours surely must be damaged.

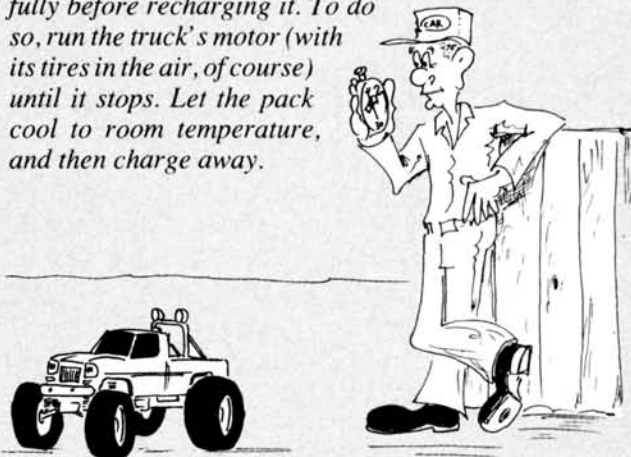
## SLUGGISH SLEDGEHAMMER

My Traxxas Sledgehammer is equipped with a Trinity Monster Horsepower Psychotic Reaction motor, a Tekin 410S ESC, ball bearings (except for the rear wheels), HPI wheels, DuraTrax tires and a 32-pitch 11- or 12-tooth pinion gear. I have two problems: acceleration and run time. With a 6-cell SCR battery pack, I can only achieve a 2 1/2-minute run time, and this includes a very slow acceleration. Please help!

**Dan Wynkoop**  
Schererville, IN

Dan, the problems you described are caused by "overgearing." This means that you're using a gear ratio that's too high for your truck, i.e., your pinion is too large in relation to your spur gear. Not only does this reduce run times, but it also makes acceleration sluggish. Higher gear ratios do, however, produce more top-end speed. The 11- and 12-tooth pinions are fine for most 540-type stock motors, but the Trinity Psychotic Reaction is a 13-turn single-wind motor, so it requires a lower gear ratio. I recommend that you try a 9-tooth pinion and work your way up or down from there.

Also, to ensure that you're getting the most from your motor and battery, clean the motor regularly, check its brushes for wear or discoloration and replace them whenever necessary. Always discharge your battery fully before recharging it. To do so, run the truck's motor (with its tires in the air, of course) until it stops. Let the pack cool to room temperature, and then charge away.



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"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah chooses your photo, you'll receive a one-year subscription to Car Action, or an extension to your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1992. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



## ■ PULLING PARADISE

Doug Peterson of Menlo Park, CA, has a weakness for pulling trucks. One truck has an aluminum chassis, a Clod rear end, an Astro Flight Pullmaster IV motor and a Parma Chevy body and Hemi. The Clod Buster has two Kyosho 360 stock motors, eight oil-filled gold shocks, a Parma '57 Chevy truck body, another Parma Hemi and a MaxTrax pulling hitch. The Clod has won first place in a concours competition as well as third place in a pulling event. Now Doug can add the Ayatollah Award to his list.

## ■ BURNIN' OFFERINGS

Sgt. Robert Lesser (aka Bitchin' Bob) has sent the Ayatollah photos of this offering: a Kyosho Lazer ZX with all the ZX-R modifications as well as ball-raced steering and hub

carriers, Schumacher saddle-pack trays, a Parma Cyclone TZ 13-turn motor and Trinity Pushed cells. Currently stationed in East Anglia, UK, Bob claims *Car Action* is the only thing he read while he was in the Gulf during Operation Desert Storm. The Ayatollah approves.



## ■ TURNING IN HIS GRAVE

This Grave Digger's delight comes from the deranged mind of Bryce deVries of Sonoma, CA. If you look closely, you'll notice that he hand-painted the grill and the headlights, and he airbrushed in some "fog" to make it look more like the full-size Grave Digger. He then added a Parma Hemi engine, which he painted right down to the butterflies on the blower. To hold it all together, he made a floor pan and firewall out of some plastic sheeting. He plans to add a detailed cockpit, working headlights and oil-filled shocks.







### ■ CAR-CRAZY CAMERAMAN

When Chicago-based photographer and confessed R/C addict David Rinker broke the stock chassis of his King Cab racing in the "concrete jungle," he made the best of the situation by rebuilding the truck and giving it some trick details. The mods include a Sassy chassis with bellcrank steering, JPS aluminum wheels, Thorp suspension turnbuckles, Trinity shocks, a Holedshot heat sink, a Bud's monster-truck wing and a Kyosho Mega Monster 22-turn stock motor. To top it all off, he chose a Pro-Line Nissan Hardbody and gave it a six-color airbrush job. We can't wait to see his next project!



### ■ HEY JEFF! HERE'S YOUR TRUCK!

Jeff Waughtal of Fresno, CA, says he'd love to see his truck in the best R/C magazine around. (Well, here it is, Jeff!) His RC10T has a Futaba Magnum Jr. radio, a Novak 410 M1c ESC, a Precision 18-turn, double-wind

modified motor and RCPS titanium turnbuckles. The only things missing are some Car Action decals, which are headed Jeff's way along with a free subscription.



### ■ FIRST TIME'S A CHARM

Kent Stone of Charlotte, NC, says that this RC10L is the first R/C car he's ever built. Powered by a Reedy Competition stock motor and controlled by a Novak 410 M1c ESC and an NER 2S receiver, he claims that it runs extremely well. The paint scheme of the Parma Merkur body was inspired by Richard Muise's "Painting and Detailing Made Easy" article in *Radio Control Car Basics*. Not bad for a first effort!

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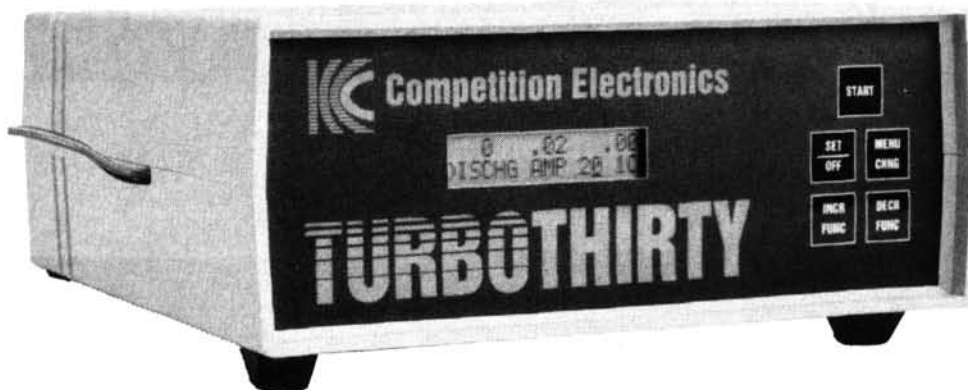


**C**HARGERS HAVE been getting pretty advanced over the last couple of years! Today, they're more than just black boxes with timers on their fronts; many do more than just charge your packs. First, we saw chargers that also had a discharge switch to drain the packs after a run; then there were peak-detection chargers with digital readouts for voltage and amperage. Technology has now progressed to a level where the chargers are micro-processor-controlled, and they perform diagnostic tests of batteries and motors. The Competition Electronics\* Turbothirty is just such a unit; it offers programmable charge and discharge settings, and you can use it to create discharge graphs, to test motors and more!

### NETTY GRITTY

First, I'll give you the basics about the "Thirty." It operates on 12 volts, which can be provided by an auto battery or a D/C power supply. Cords are provided so that you can connect the Sermos connectors that exit the unit's case to the power source and your pack. The input and output connectors are polarized to prevent improper connection.

As soon as you hook up the Thirty, the cooling fan will rev up and the multi-segment LCD will come to life. This display shows supply voltage, pack voltage, charge amps, charge time and mode of



C O M P E T I T I O N E L E C T R O N I C S

# TURBOTHIRTY

by JOHN HUBER

operation. In the discharge mode, discharge time will be displayed.

### CHARGING

As I mentioned before, the Thirty offers many charging options. It will charge from one to seven cells linearly at a digitally adjustable amperage of up to 12 amps. Whether you hook up one, two or seven cells, the Thirty will automatically adjust, and charging will stop after peak detection. You can set the peak drop-back voltage, although the unit will warn you of incorrectly set values.

You can also program the Thirty to re-peak twice; again, delay time and amperage are programmable. The display tells

you if you're in a delay mode or a charge cycle. When charging is complete, view the peak-charge voltage by pressing the "INCR FUNC" button until "PEAK CHG V XX.XX" appears on the LCD. (The Xs indicate the voltage.) To prevent you from overcharging a pack that won't peak, the charger will shut off after a 3000mAh charge has been delivered.

### DISCHARGING

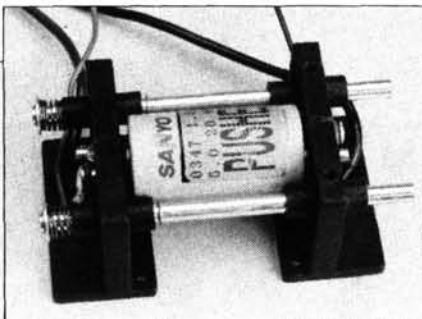
This unit is called the Turbothirty because it can discharge a single cell (in the included cell holder) at a rate of up to 30 amps. Four-, six- and seven-cell packs can be discharged at a rate of up to 25 amps. The minimum rate is 5 amps.

After you have a fully charged pack hooked up to the Thirty, discharging is just a push of a button away. While the pack goes through this cycle, the pack voltage, the discharge amperage, and the discharge time are all displayed on the LCD. When the discharge cycle is complete, you can view the batteries' internal resistance and other values by flipping through the Thirty's menu.

There are a few things that I didn't like about the discharge mode. I can see why it's



*The Turbothirty will charge single cells and packs. A single-cell holder is included with the unit.*



PHOTOS BY JOHN HUBER

# charge it!



# TURBOTHIRTY

necessary to have a maximum discharge amp capability, but why is there a minimum? And why is it restricted to only one, four, six, or seven cells?

Charging my gas car's 5-cell, 1000mAh receiver pack wasn't a problem, because the Thirty adapts to the pack voltage (up to seven cells) and will charge at as little as .3 amp. I couldn't discharge it, however, because there isn't a voltage cutoff setting for 5-cell packs. The people at Competition Electronics explained that they designed the Thirty for one, four, six, and seven cells simply because they're the most popular R/C configurations. The average racer doesn't need settings for two, three and five cells.

## AUTO-CYCLE MODE

The Thirty can also run up to nine cycles on a given cell or pack, with up to a 16-hour wait between each. As with the other modes, all the values are adjustable, and the phase of the cycle is displayed on the LCD screen. In the first part of the cycle, the pack is charged according to the settings. After the pack has peaked, the Thirty switches into a 15-second delay mode. Then the discharge mode begins, followed by either a cool-down period before the next cycle or the completion of the cycle.



*The JR Designs pan-car stand is perfect for the TurboThirty; you can also mount the Thirty's single-cell holder onto the base.*



*When the TurboThirty is in the charge mode, information is displayed on the LCD screen. Clockwise from top: number of seconds into the charge mode; pack voltage; charge amperage; power-supply voltage; cycle number; and mode.*

## MOTOR-RUN MODE

This is one of the Thirty's best features. In this mode, you connect your motor to the Thirty, program the voltage and the run time, and the Thirty will read the motor's current draw. This mode is great for testing or breaking-in motors. A slow start is used to start the motor, preventing your power supply from going into overload. The motor "ramps" up to speed in 3 seconds, eliminating the huge current draw motors usually cause when they're started.

## BUZZ-BOX MODE

If you want to give your SCR packs a boost before your heat, the Thirty offers a Buzz-Box mode that lets you set the charge for up to 18 amps! This type of charging is dangerous, so it will run for only 19 seconds. It's also recommended that you don't use this mode more than once a charge, or the cells may vent. This mode is designed for SCR cells *only*! SCE

cells degrade quickly when charged at high rates.

## PRINTER PORT

A printer port is available as an option for the TurboThirty. It enables the Thirty to print detailed graphs of the discharge mode of cells or packs. The voltage of the pack is plotted on the graph every 5 seconds, giving an accurate discharge curve. My Thirty came with the port, so all I had to come up with was a cable and a printer. Now, I can keep records on all my batteries for future reference and comparison. For \$100, Competition Electronics will add a printer port to any Thirty.

## STAND TALL

There isn't much more to tell you about the Thirty, but there *is* something that you may want to pick up if you have one. Because the unit uses an LCD screen, it's only visible from certain angles. This makes it hard to see the display when you're standing over a pit area. Competition Electronics recommends that you use a Radio Shack calculator stand to tilt the front of the unit up for better visibility; this is an expensive charger, however, not a \$5.95 calculator, and although the Radio Shack stand works and is very inexpensive, it isn't very sturdy.

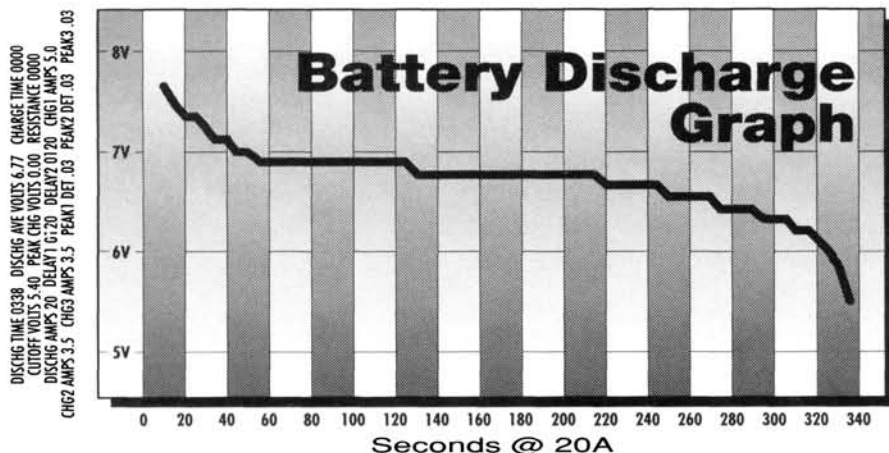
I recommend that you use a JR Designs\* pan-car stand for your Thirty. It holds the unit at a perfect angle, it's made of colorful acrylic, and it's very sturdy. The base is also a great place on which to mount your single-cell holder.

All in all, I love the TurboThirty! It performs all my charging and discharging needs and much, much more!

*\*Here are the addresses of the companies mentioned in this article:*

**Competition Electronics Inc.**, 3469 Precision Dr., Rockford, IL 61109.

**JR Designs**, 1225 Lance Ln., Anaheim, CA 92806.

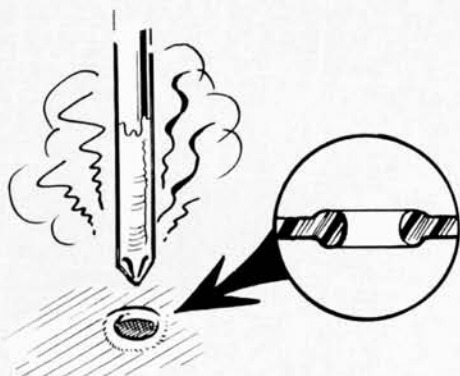


*With the optional printer port, the TurboThirty can print graphs similar to this. For clarity, we simplified this graph to show readings taken every 20 seconds, although your graph will show them every 5 seconds. All the charge/discharge information will be displayed at the head of the graph.*



# PIT TIPS

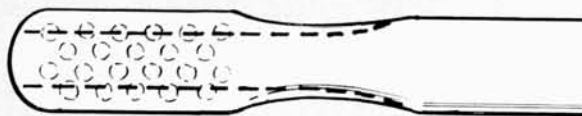
by JIM NEWMAN



## RAISED-EDGE ANTENNA HOLE

Instead of drilling a hole in a Lexan car body, make the hole with a hot (but not red-hot) Phillips screwdriver. As the tool melts through the plastic, the plastic will form a raised edge, and this will make it stronger and more resistant to cracking.

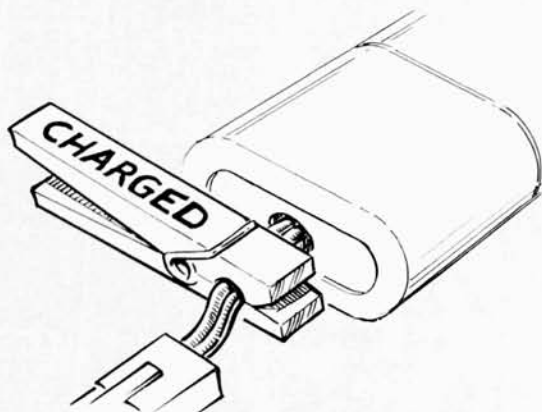
*Ryan Mahoney, Naper, IL*



## NARROW CLEANING BRUSH

Cut the sides off the head of an old toothbrush, leaving only two rows of bristles. With this narrow cleaning brush, you'll be able reach previously inaccessible areas.

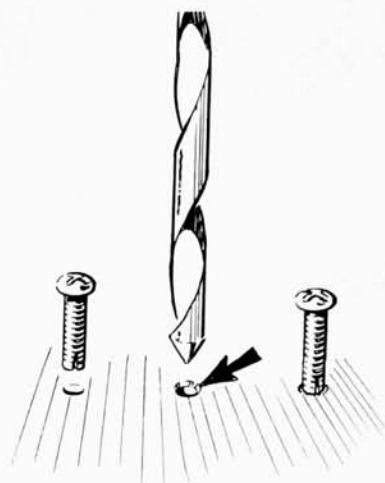
*Mark Toburen, Everett, WA*



## BATTERY-CONDITION MARKERS

Show the state of your Ni-Cds by attaching appropriately marked wooden clothespins to the battery leads. You could also paint some clothespins bright green (for "go") to make your charged batteries easy to find when you're preoccupied with a race.

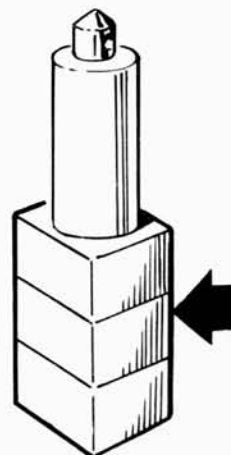
*Craig Perriti, Westville, Natal, S. Africa*



## SCREW-HOLE START

It's often difficult to make a flat-ended screw bite when you start to screw it into a plastic part. Drill a shallow hole in the plastic; it will give the screw's end threads a chance to start. You could also make this "starter hole" with the end of a Phillips screwdriver, but a drill bit makes a neater hole more easily.

*Eric Nowicki, Brookhaven, NY*



## LEGO BODY LIFTS

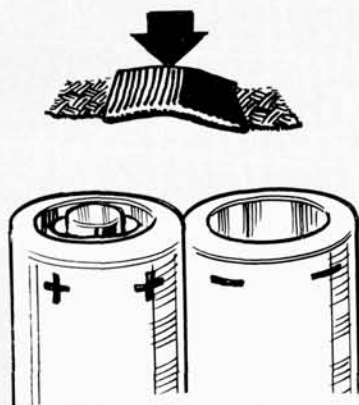
Glue small, square Lego blocks together, and use them to raise the body of your R/C truck or car. File the raised "pip" off the top block, drill down through the blocks, then use longer screws to attach the body mounts to the chassis.

*Douglas Edwards, El Cajon, CA*

**PLEASE NOTE:** Be sure to print your name and full address clearly on every letter and sketch you send to Pit Tips. We have to throw away many good tips because we don't have the sender's name or address.



# PIT TIPS



## NI-CD STRAP INSULATOR

Instead of using a plastic washer to insulate a positive Ni-Cd terminal, why not cover the braided straps that join the cells with shrink-wrap? You could even use a washer and shrink-wrap—double insulation.

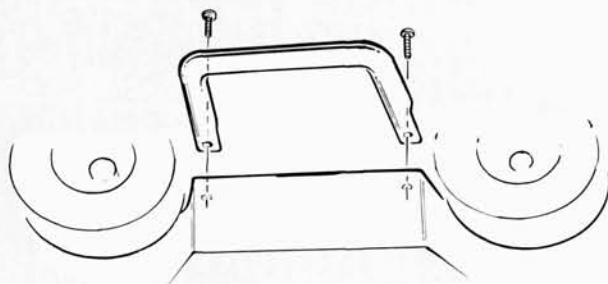
*Tim Duchene, Kankakee, IL*



## PAINT PROTECTORS

To prevent the movements of your car body from wearing away the paint, put a thin felt washer on top of each body post.

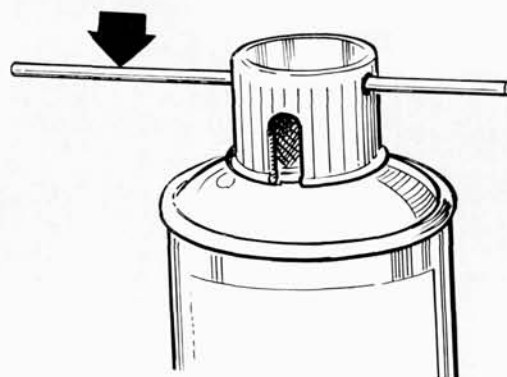
*Ryan McGauley, Pembroke, Ontario, Canada*



## HOME-BREW NERF BARS

To prevent the wheels of other cars from getting between your car wheels and flipping it, make a nerf bar and screw it to the bottom of the chassis. To make the bar, bend a piece of thick-aluminum tube, or use small, hardware-store aluminum angle instead. (If you use tube, bend it with a tube bender to avoid flattening it at the bends.)

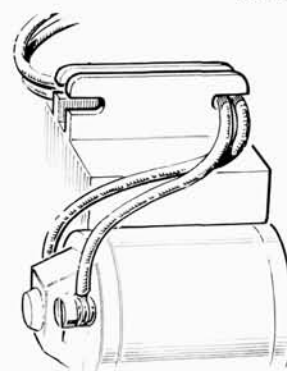
*Matt Bolzman, FPO, San Francisco*



## SPRAY-TUBE STOWAGE

If you use canned compressed air, motor spray, or WD-40 you know how easy it is to lose the plastic extension tube. Avoid this by drilling through the cap above the top of the push-button, then push the extension tube through the cap, as shown.

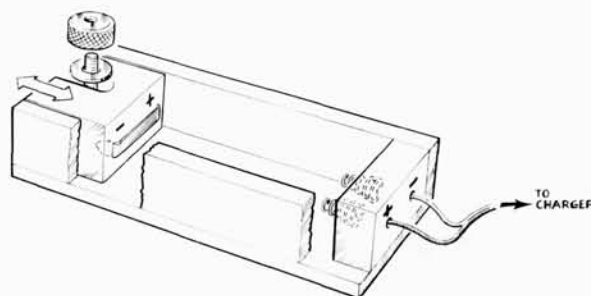
*Scott Seydor, Comp Hill, PA*



## JR-X2 WIRE ROUTING

If the wires that run from the speed controller to the motor are too long, they'll flap around while your JR-X2 is running. Instead of cutting the wires on your JR-X2, just route them through the slots, as shown. On the RC10, run the wires behind the two wing-mounting tubes.

*David Nguyen, Diamond Bar, CA*



## HOME-MADE BATTERY HOLDER

Made of hard balsa, basswood, or pine, you can use this 6-cell holder when matching or checking cells or checking motors before you assemble them into packs. Note the sliding block with the copper strip, washer and thumb nut; it guarantees good battery contact.

*Jackson Bennett, High Springs, FL*

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



# RADIO CONTROL CAR ACTION

# TOP 10

## SPECIAL

EVERY YEAR, Car Action's crack editorial staff adjourns to the Ayatollah's personal conference room for a day. The purpose of this high-level round-table meeting? Choosing the year's top 10 winners in a number of categories! Piece of cake, you think? Ha! Nothing could be further from the truth! Take the "Top 10 Cars," for instance. With the new entry-level cars, the updated versions of old favorites and the new breed of racing trucks, the competition was close enough to make Chris Chianelli's hair fall flat! But hey, you guys expect us to pick the 10 best cars, drivers, accessories, "Pit Tips," and "Readers' Rides"—so we did. We even added categories: tracks, hop-ups and a few twisted top-10 topics of our own. You can rely on your friends at Car Action to give it to you straight!





# TOP 10 CARS

*Choosing the top 10 cars for 1992 was very difficult; only determining the top 10 drivers was harder. But, after beating ourselves (and one another) over the head for a few hours, we decided that these are the cars that represent the best of their categories.*

## 2WD OFF-ROAD

### Associated RC10 Team Car

The RC10 Team Car has had great success during the last year. After the JRX-Pro was introduced, the popularity of the RC10 seemed to decline; the Team Car changed that. Such

features as the legendary Stealth transmission, hard-coated shocks and universal-joint drive shafts make this car difficult to beat. An optional aluminum chassis is available in five fluorescent colors.



Associated has done it again with the RC10T. The company may not have been the first to produce a real racing truck, but when it did—boy, oh boy! The RC10T comes

## RACING TRUCK

### Associated RC10T



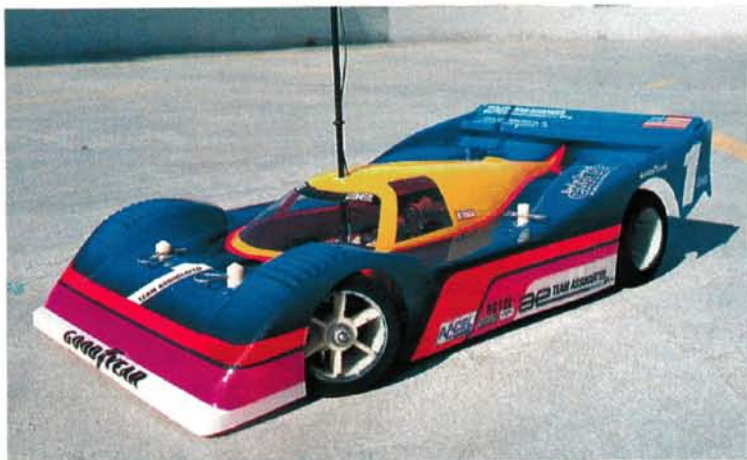
with the Stealth transmission, super-long front and rear arms, long Team shocks, special shock towers, an awesome Lexan body, and three sets of tires and rims—two sets of fronts (one narrow, one wide) and one set of rears—not bad!



## 1/12-SCALE ON-ROAD

### Associated RC12LW

Associated's world-champion RC12LW is similar to the modified RC12L that was used in the worlds in Singapore. The cell slots have been centered for better weight distribution, and the rear of the chassis has been stiffened. Joel Johnson's recent victory with this car at the Cleveland Indoor Champs ensures that it will be a driving force in 1/12-scale racing.



## 4WD OFF-ROAD

### Kyosho Lazer ZX-R

For years, you had to buy a lot of optional goodies to boost the performance of your 4WD car. That isn't the case with Kyosho's new, completely updated Lazer ZX-R. Ball differentials replace the ZX's gear diffs, and up front, the ZX-R has longer shocks to absorb the bumps better. The ZX-R is sure to be a tough contender in '92.

## 1/10-SCALE GAS

### Schumacher Nitro 10

There aren't many 1/10-scale gas trucks out there, but this one is truly the *crème de la crème*! The Nitro 10 comes with a powerful .15-size engine and has a belt-drive transmission. The chassis is based on that of the Cougar electric buggy, so many parts can be used on both cars. A recoil pull-starter is included, as well as an on-board glow battery. Fuel the car up through the quick-fill lid, flip a switch and give the starter a pull! What could be easier?





# TOP 100

## **SUPERSPEEDWAY**

### **Hyperdrive Hyper 10SE**

In the burgeoning R/C superspeedway scene, one chassis has emerged ahead of the pack—Hyperdrive's H10SE. It has all the features you'd expect in a top-of-the-line car (a narrow chassis, a split-beam front axle, etc.) and a successful oval-only design, but you don't have to equip it with after-market mods to take home the gold. Bud Bartos drove an H10SE to victory in the '91 Thunderdrome's Invitational Enduro Class.



The popularity of 1/8-scale off-road gas racing is growing by the minute. The speed of the cars and the sound of their screaming .21

## **1/8-SCALE GAS**

### **OFNA Pirate M-1**



engines make this a thrilling class. At the '91 Kyosho 1/8-Scale Gas Challenge, Cliff Lett's Pirate made a name for itself when it beat Kyosho's car. With many unique features and loads of available after-market parts, the Pirate kit remains a constant threat. It's a serious machine!



## ENTRY-LEVEL

### Team Losi Junior Two

Manufacturers of full-size autos rely extensively on auto racing for new technology, and Team Losi has taken a page from their book. The Junior Two is derived from Team Losi's experience in its years of racing. With its fiber/resin chassis, fully adjustable, four-wheel independent suspension and low-rotating-mass transmission, it performs nearly as well as the JRX-Pro, but cost-saving measures such as bushings (instead of ball bearings) and molded shock towers (instead of graphite ones) make it affordable enough for beginners.



## 1/10-SCALE ON-ROAD

### Associated RC10L

The wide-version 10L is the hands-down choice of roadcourse racers worldwide. Topped with your favorite Can-Am or GTP body, the 10L looks great as it tears up the left and right turns of any carpet or asphalt track. Joel "Magic" Johnson used a 10L to capture the '91 ROAR On-Road Nats Modified Class crown. In fact, six out of the 10 A-Main finishers at the Nats used this car.

Tamiya has regained the title of Top Monster Truck. Although the Bullhead is similar to the Clod Buster, it has a new chassis with metal and plastic reinforcements and a new Kenworth-type body. Its live-axle design seems more rigid and forgiving than even the USA-1's independent suspension. If you add aluminum gearboxes and steel gears, the truck looks totally "trick" and ready for serious pulling. The Bull is at the head of the class.

## MONSTER TRUCK

### Tamiya Bullhead





# TOP 10

# READERS' RIDES

ONE OF THE highlights of our day (in addition to our "rubber-band" wars) is reading the mail—especially the "Readers' Rides" submissions. The topnotch photographs of the beautifully detailed bodies clearly show the creative, artistic side of the R/C community. With more than 80 cars featured every year, it's tough to choose the best. Still, we managed to narrow the field down to the year's top 10.



## KING TIGER

Mark Piotrowski of Chicago, IL, decided to make a monster tank. He used a Tamiya King Tiger Tank as a base and added a 4-channel radio, a Revtech 18-turn double motor, an 8-cell battery pack, a body that can be lifted to expose a driver and a detailed Parma Hemi engine. A set of working fog lights adds the final details to a great package.

## HOT HEMI!

Norman Sizemore of Ft. Wayne, IN—a street-rod kind of guy—went all-out on his Parma Hemi Coupe. He added a new mesh grill, gave the body a "fade" paint job and added plug-wire details to the engine. Custom headers and a full set of lights finish off the car.



## PICTURE PERFECT

Michael Calcote of Amarillo, TX, is a professional photographer, and he wanted his car to reflect that. His creation is a Team Losi JR-XT with a Kodak film body. He made several mods to enable the truck to run with the big boys. He added a Tekin 411P, an MIP slipper clutch, Lunsford titanium tie rods and Losi stagger-rib front tires and X-pattern rears for extra "grip." Using this truck, Michael has walked away from seven races with a total of four first places and two second places.



## SIDEWAYS SNAKEBITE

Dave Hartrantf of Schuylkill Haven, PA, races his RC10 Team Car in the rookie division of the modified dirt-oval class at the Cressona (PA) Mall Speedway. To the formidable Team Car package, Dave added a Futaba radio and speed controller, a Trinity Joel Johnson stock motor and a set of Bolink foam racing tires. A dirt-modified body with a Don "the Snake" Prudhomme-style paint job tops everything off. Killer machine!



## BOUNCING BABY BED

In the style of the "Primadonna Clod" (August '91 issue) comes this crazy-looking Clod Buster. Jimmy "Jimbo" Keola of Kaneohe, HI, started with a stock Clod and worked his way up to this beast! This Clod's most distinctive feature is its "dancing" bed, which moves in six directions and spins clockwise and counterclockwise. Finishing off the look is a wild, 11-coat, candy-cherry-over-white paint job with six coats of clear protectant.







### PHUNKI

The answer to that age-old question, "What happens when you leave an RC10 and an old Kyosho Elec Rider in the same room overnight?" has finally been answered. Chris Mertl of Vienna, Austria, was instrumental in creating this...umm...thing. With an RC10 rear end, an MIP gearbox, Technacraft wheels, a Trinity 13-turn double motor and Andy's A-arms, this thing really moves. A VW bug body covers it up. Weirdo.

### HEAVY METAL

Steve Betts of Fremont, CA, owns this heavy-metal JR-XT, and it's different from any we've ever seen. Steve made his own chassis of carbon-fiber laminations, Kevlar and end-grain balsa; it's lighter than the stock chassis, but just as rigid.

To ensure that no one else would have a car like his, Steve made a two-speed tranny like the one in the 1/8-scale on-road BMT car.

With innovations like these, it's no wonder that Steve finishes in the top three at his local track!



### VERY "COUPED" UP

John Insabella of Garwood, NJ, likes to build his own cars out of spare parts, and one of his finest creations is this '33 coupe. He started with a scratch-built chassis to which he added an adapted rear end that he took from a Midnight Pumpkin and a front end of his own design that uses Lunch Box spindles. The Futaba radio gear is hooked up to a Trinity Joel Johnson motor. John's finishing touches include a set of JPS diamond-spoke rims, Imex Olympic tires, a fully detailed hemi engine under the hood and a Parma '33 coupe body with a 1990 GM red color scheme.

### NOTHING BEATS A BUD

Bob Humphrey of Cincinnati, OH, must be a big fan of the Mickey Thompson Stadium Series, because he decided to copy the paint scheme of Roger Mears' car. (Roger is the brother of Indy Car driver Rick Mears.) To a JR-XT, Bob added a set of jet-black HPI rims, standard Losi tires and a Race Prep Chi-Town Hustler motor. For control, he chose a radio and an electronic speed controller from Futaba.



### DUTCH TREAT

This scale-looking Berton TenForce comes from Rob Adelaar of the Netherlands. Because he wanted a scale-looking car, Rob topped the already potent chassis with an Andy's IMSA Audi 90 Quattro body. He also added a Corally Digital Motor Management System II, an Airtronics 94141



super servo, a Futaba Megatech PCM (Magnum PCM) radio and a Trinity 18-turn double motor. The finishing touches include Tamiya scale decals and a paint job that resembles the full-size race car.



# TOP 10

# DRIVERS

*If one "Top 10" category was the most difficult to pick, this was it, hands down. There's such a plethora of driving talent from which to choose that narrowing it down to a mere 10 created massive migraines! We were committed, however, to do just that. The drivers we've picked may not be the ones you would have picked, given the chance, but we do feel that, based on their 1991 performances, their general sportsmanship (an important qualification) and their contributions to R/C racing, these drivers are the best!*



## MASAMI HIROSE

Without a doubt, Masami is the most successful R/C driver in the world. He first achieved fame in '87, when, as an unsponsored driver, he won the 4WD class at the IFMAR Off-Road World Championships with a box-stock Schumacher Cat that he built at the track! Masami has also proven that he's a force to be reckoned with in 1/12 scale, taking the '88 IFMAR World Championship title. As if this weren't enough, he swept the '89 Off-Road World Championships, winning both the 2WD and 4WD classes! Most recently, he won the 2WD class at the '91 IFMAR Worlds—his fifth world title. When he isn't racing, Masami is a sales engineer for Yokomo.



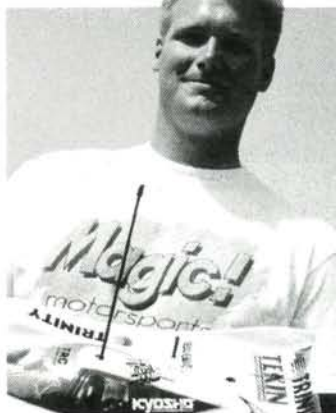
## CLIFF LETT

Cliff began his R/C racing career when he realized that much of what he'd learned as a factory mechanic for Team Yamaha also applied to off-road R/C cars. When he left Yamaha in '87 to work for Associated Electrics full time as an R&D manager, Cliff's racing success increased dramatically. Cliff's list of wins includes seven ROAR national titles and two NORRCA national titles. Although these are impressive, Cliff's A-Main 2WD and 4WD finishes at the '89 Off-Road Worlds, and his 4WD victory at the '91 Worlds, are his crowning achievements.

When it comes to 1/12-scale racing, Joel "Magic" Johnson is definitely the class of the field. Joel started racing at an early age, and he and Trinity's Ernie Provetti dominated the 1/12-scale racing scene, garnering 11 ROAR national titles

## JOEL JOHNSON

between '81 and '86 in both 4- and 6-cell roadcourse. Joel proved his versatility as a driver when he won the IFMAR 2WD Off-Road Worlds in '87. Since then, he has top-qualified at both the '90 ROAR Dirt and Paved Oval Nats, and he won the '91 ROAR 1/10-Scale On-Road Nats.



Kyle was hot in '91, placing third at the IFMAR 2WD Off-Road Worlds in Detroit, MI, and

## KYLE REED

then sweeping the 2WD Stock and 2WD Modified Classes at the ROAR Off-Road Nats in Savannah, GA. An R&D technician for Team Losi when he isn't racing, Kyle's substantial list of victories includes his '90 ROAR Off-Road Truck and 2WD Off-Road Stock national titles, as well as his '89 NORRCA Off-Road Truck Nats victory.

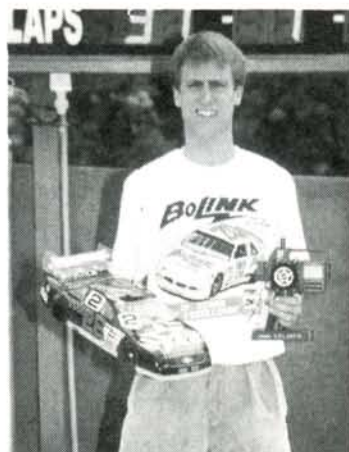




If there's an off-road A-Main being run, chances are you'll find this man in it somewhere! Dunn is one of the fastest dirt drivers ever to pick up a transmitter. Holder of two ROAR national championships ('91

### MIKE DUNN

4WD Off-Road and Stock Truck), Mike also made A-Main showings at the '89 and '91 IFMAR Off-Road World Championships (2WD fourth place; 4WD 10th place, respectively), and he's a three-time Hawaiian State Off-Road Champion. He and his brother Steve help their father run his company, Race Prep.



### TERRY ROTT

If Terry Rott's name doesn't sound familiar, then you don't follow the 1/12-scale and paved-oval racing scenes. Terry cut his racing teeth on the carpet roadcourse tracks in his home state of Michigan. He proved his mettle by winning the prestigious Cleveland U.S. Indoor Championships in '84 and '85—quite a feat! Not content with his 1/12-scale accomplishments, Terry expanded his racing repertoire to include 1/10 scale, where he garnered two ROAR national championships ('89 and '91 Paved Oval).



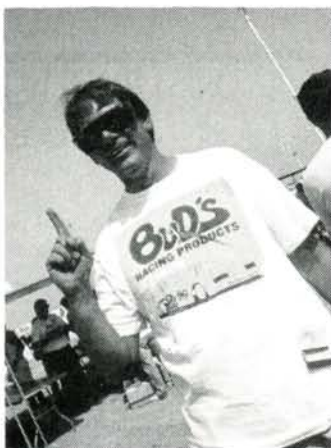
### JACK JOHNSON

Originally from Las Vegas, NV, Jumpin' Jack Johnson is an off-road specialist who has won three ROAR national championships ('89 2WD Modified; '90 Truck Stock; '91 Truck Modified) and five NORRCA national championships ('89 2WD Stock, Modified and Truck; '90 2WD and 4WD). Jack also put in a strong showing at the '91 IFMAR Off-Road Worlds, setting the fastest single-lap time and finishing an impressive third overall in the 4WD class. Jack is Team Losi's racing team manager as well as an R&D technician.

Even among top 1/12-scale racers, his name stands out. This Ohio

### CHRIS DOSECK

native began his racing career in '83 and has since scored many victories against the world's best. Although he has earned two ROAR national titles ('88 Dirt Oval 4WD Stock; '91 1/12-Scale Paved Oval), Chris's performance at the '90 IFMAR 1/12-Scale World Championships (where he won, TQ'd and even won the Concours) heads his list of achievements.



### BUD BARTOS

If one man is single-handedly responsible for the incredible popularity of R/C super-speedway racing, then Bud Bartos is that man. Although he was originally an avid slot-car racer, Bud became involved in 1/12-scale R/C (where he won the '84 Stock World Championship), then in concrete oval racing, which was a small segment of the hobby at the time. For years, Bud terrorized the competition at Lake Whippoorwill International Speedway (one of the country's first superspeedways), but he made a comeback in 1/12-scale carpet racing by winning the ROAR '91 National Championship. Bud spends most of his time managing his company—Bud's Racing Products—which manufactures high-quality after-market R/C parts and accessories.

Like many of today's hottest on-road drivers, Kent started out racing 1/12-scale cars. In the late '70s, he and his racing partner, Mike Lavacot, enjoyed great success on the track. In '82, Kent's win at the IFMAR 1/12-Scale Worlds cemented his status as 1/12-scale's top gun. Kent's winning streak continued throughout the '80s and

### KENT CLAUSEN



earned him seven ROAR national titles. Kent is also the proud holder of two R/C Thunderdrome Insane Speed Run records—the first from '89 (70.1mph), and the second from '91 (75.96mph). Kent and Mike formed LAVco, a leading manufacturer of battery and motor analytical equipment.



# TOP 10

OK, LET'S face it. There are many, very cool, high-tech R/C-car accessories; so many, that we had to divide them into two categories: high-end and low-buck. Unless you're Richie Rich, you probably won't want to buy all the high-buck accessories. We created this list after checking out the goodies that were released during the past year. Watch your wallets, and enjoy!

## HIGH-END ACCESSORIES



### TEKIN PRO DYNO

Dynos are becoming very common in the pits, and one of the most popular is the Tekin Pro Dyno. This compact device enables you to determine the condition of your stock or modified motors accurately. It displays the no-load amp draw, the rpm and the power for easy comparison. All the new Pro Dynos come with nylon hold-downs.



### UNGAR RACE STATION

The Ungar Race Station is the perfect trackside soldering unit. Its temperature adjustment is on its base, which also holds the iron and a sponge for tip cleaning. From delicate circuit-board work to heavy-duty battery assembly, the Race Station delivers just the right amount of heat. Special tips are available for a variety of applications.



### NOVAK DIGI-PEAK PLUS

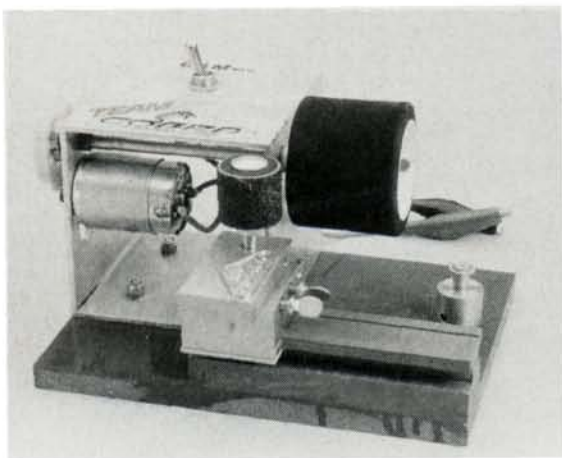
Although it's small, Novak's new Digi-Peak Plus charger is loaded with features. It will charge in the linear or pulse mode at up to 10 amps. It can also trickle-charge at .3 amp, so it's perfect for receiver packs. Its LCD shows you the charge amperage and voltage and the source voltage. When the heat is on, Novak's optional fan can be connected to the heat sink in a snap!



### VICTOR IQ POWER 1

If you need a small, reliable power supply, check out the Victor IQ Power 1. This 4-pound unit delivers a constant 12 amps of clean, regulated 14V DC power. Although it was designed to accompany Victor IQ chargers, it will work with any charger.





### COBRA TRACKSIDE TRUER

Cobra's Standard and Deluxe Trackside Truers enable you to cut 1/10-, 1/12- and 1/8-scale foam tires accurately. These small, portable machines are powered by 7.2V batteries. Several optional arbors are available, and you can also order custom-made ones. The Standard Truer has bushings and a gear-drive system; the Deluxe, ball bearings throughout and a belt-drive system.



### TWISTER PRO MINI LATHE

Twister updated its Pocket Lathe by giving it a rechargeable power supply. A 4.8V Ni-Cd battery that's housed in a sturdy case is mounted to the base of the Pro Mini Lathe. The lathe also has an AC trickle-charger that enables you to charge the batteries overnight, and it comes in a handy carrying case



### COMPETITION ELECTRONICS TURBOMATCHER

During the last few years, the Turbomatcher has become the industry's most popular cell-matching system. It provides all the features found on earlier "professional-grade" matchers in a small, portable package. If you connect the Turbomatcher to a printer, you can print labels for your packs, too.

### CAR ACTION SC-800

How do you analyze your driving? Have a friend record your lap times on the SC-800. You can store up to 50 lap times for comparison. To convert times into average mph, just enter the length of the track. If you act now, you'll also get a set of matching kitchen knives! Just kidding. The SC-800 *does*, however, have a clock and an alarm to get you to the line on time.



### TRINITY 6-INCH DIGITAL CALIPER

A caliper is one of the handiest tools you can own. Trinity's 6-inch digital version accurately measures items to within 1/1000 of an inch (1/100 of a mm), and it shows the measurements on an LCD. Imagine...a tool that makes it easy to match the lengths of your tie rods!

### ALEX'S COROLLA

This sleek, swift silver Corolla has a 1.6-liter NOHC (no-overhead cam) 4-cylinder engine that transmits an awe-inspiring 52.3bhp through the car's "mono-speed" transmission, which has bronze bushings. The car also features active suspension (it acts as if it weren't there!), on/off throttle control and Densifog™ windows. You won't play games with this death-mobile!

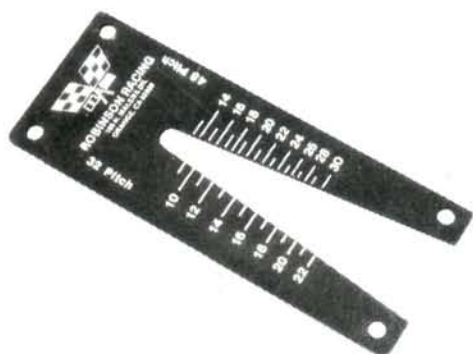




# TOP 10

ALTHOUGH MANY products will break your bank account, many of them won't. Some items are valuable because they make your life easier—not because they're expensive. The top 10 low-buck items are just such accessories.

## LOW-BUCK ACCESSORIES



### ROBINSON PINION GAUGE

Many manufacturers don't print the number of teeth on their pinion gears, and this makes it difficult to determine which gear is the "right" one. Robinson Racing's gauge calculates the number of teeth based on the gear's diameter. Just put the pinion in the V-shaped slot, and slide it down until it stops, indicating the number of teeth.

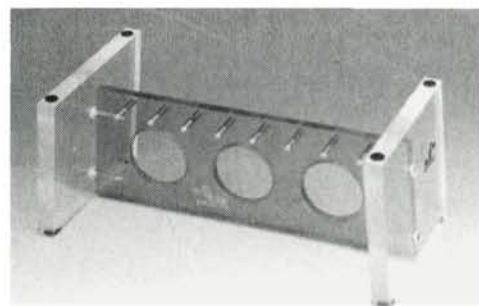


### TRINITY PINION WRENCHES

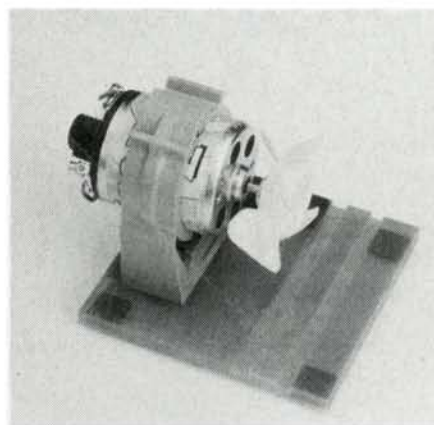
If the wrench doesn't fit the setscrews on your pinions perfectly, you won't be able to secure the pinions properly. You might also damage the setscrews, making removal a chore. Trinity pinion wrenches solve this problem. Made of drill-blank steel, these strong, high-quality wrenches are available in standard and metric sizes.

### JR DESIGNS CAR STAND

JR Designs offers some of the "trickest" and most useful car stands. Several colorful models are available, including a pan-car



version, which works well with the Turbothirty charger, and an off-road version that can double as a pinion caddy. All the stands are made of acrylic and have rubber feet.



### CLASS RECREATIONAL MOTOR STAND WITH FAN

It's important to break-in your motor properly, and connecting it to a battery isn't enough. Class Recreational's motor break-in stand comes with a fan that puts a load on the motor and directs cool air around it. The stand holds the motor

firmly in place, and there are grooves in it that enable you to contour your brushes.

### CAR ACTION TRAK PAK

The Car Action Trak Pak will help you organize your R/C goodies. This padded, hot pink, nylon bag comes with three corrugated boxes that will hold most cars, chargers, radios, tires and whatever else you drag to the track. The Car Action logo is printed on its sides. (Dimensions: 17x20x11.5 inches.)







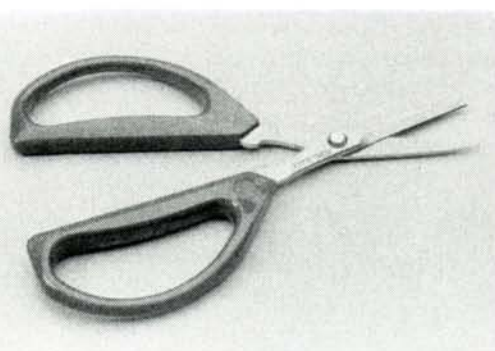
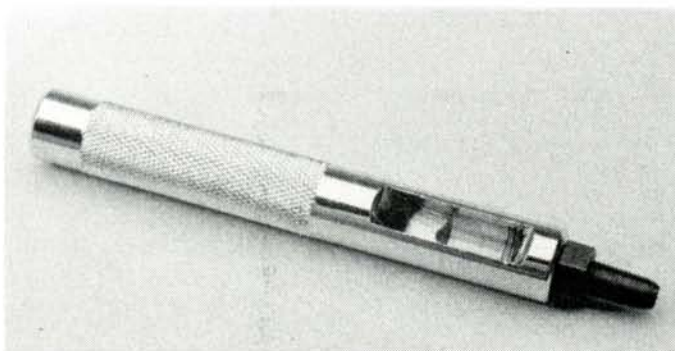
### **S&K BRUSH-HOOD ALIGNMENT TOOL**

For optimum motor performance, the brush hoods must be positioned directly opposite each other. S&K's hood-alignment tool allows you to set the hoods when they're on the motor. To lock them in place, just tighten and apply solder to the screws.



### **TRINITY AA-CELL CHARGER**

Charging AA cells can be a hassle. They're vital to the transmitter, but who has the time to wait for an "overnight" charger? Trinity now offers a great Sanyo charger that will charge four cells in an hour. Just plug it into any 110V outlet!



### **RCPS TIRE PUNCH AND SNIPPERS**

Tire preparation is critical in off-road racing, and RCPS has developed a great set of tools to help you with it. You use the snippers to cut tire spikes cleanly and the tire punch to cut perfect 1/8-inch-diameter holes in the treads to allow air to enter the tire, but not dirt. Serious off-road racers will find both tools extremely valuable.



### **RPM CAMBER GAUGE**

How do you adjust camber when you don't know where the settings are? You use the RPM camber gauge. It measures from +10 to -10 degrees in 1-degree increments, and it has a thumb wheel that enables you to lock the settings in place. Now you can adjust your car's camber without guesswork.

### **DAN'S TILTER**

If you own a Tekin charger, then you need the Tilter. It holds your charger at a slight angle so that you can see the indicator more clearly. It also enables the heat sinks to work more effectively than they would if the charger were lying flat on a table. Velcro® strips are included to secure your charger to the Tilter.





# TOP 10

# HOP-UPS

*In the past year, several new products have entered the R/C scene and flourished, while others have simply faded away. This top 10 list features add-on items that will make your car go faster, run longer, or turn tighter. These are our picks for the 10 best hop-ups that money can buy.*



## Robinson "Titanium Gold" Pinions

The latest after-market craze seems to be pinion gears—milled out, profiled, coated and stamped. Some of this may seem superfluous, but racers want every possible advantage. Robinson Racing Products makes some of the best pinions on the market—the Titanium Gold series. They've been lightened, stamped and coated with titanium nitride (a self-lubricating coating that runs with less friction and reduces wear).



## Paris High-Energy Quiet Pipe

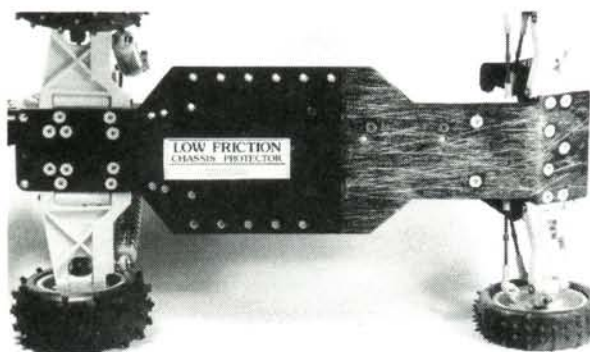
If you're after power, check out Ron Paris Racing's High-Energy Quiet Pipe. The six radially arranged holes in the first (tuned) chamber are designed to disperse excess pressure

and smoke waste without wasting power. The pipes are hard-anodized, which makes them easy to clean and increases their surface tension. This gives them greater resonance, which makes them more efficient.

## Litespeed Tuff-Stuff

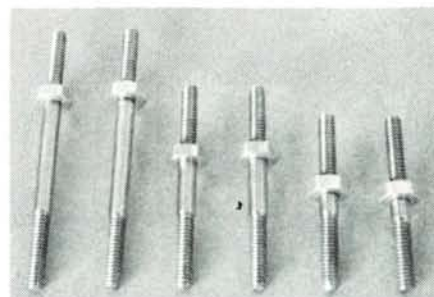
Don'tcha just hate it when your new car bottoms-out and the bottom of its expensive graphite chassis is damaged? After a while, it looks as if you

forgot to put shocks on the chassis! (Ooooh, we really hate it when that happens!) Don't despair! Tuff-Stuff low-friction, adhesive chassis protector keeps the chassis looking new, and prevents your car from losing speed when it bottoms-out.



## Novak NER-3FM Receiver

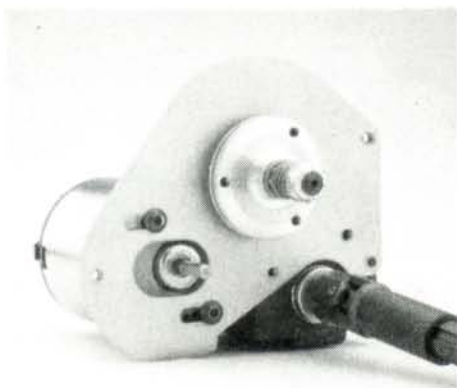
Novak's compact, 3-channel, narrow-band FM receiver is compatible with Futaba's PCM and Magnum FM and Airtronics's CS2P and Caliber 3P. It comes with plastic Futaba J-type plugs (the only style plugs that will work with it), and it's perfect for people with one FM radio and two cars.



## RCPS Titanium Turnbuckles

When it's time to trick out your race machine, upgrading to titanium turnbuckles is a good way to start. Those offered by RCPS are stronger and lighter than steel turnbuckles, and they're easier to adjust than standard tie rods.





#### **A&L Power Clutch**

The slipper clutch is one of the most important advances in off-road racing technology. It regulates the amount of wheelspin a vehicle has during acceleration, and it limits the severity of the shocks to the drive train when the vehicle lands after jumps. A&L's Power Clutch uses high-quality, machined pressure plates and a Rulon clutch disk to control the motor's power. Unlike other slipper clutches, the Power Clutch allows you to change the spur gear without disassembling the slipper. Models are available to fit the following trannies: MIP RC10, MIP Losi, A&L and Team Losi.



#### **RPM Spring Collars**

Adjusting the spring tension on off-road cars can be one of the most irritating tasks known to man. Because it's almost impossible to set up the tension on all the shocks identically, the car rides unevenly and makes cockeyed jumps. If, by some miracle, you do set them correctly, the collars will slip on the shock body and change your settings. RPM's spring collars let you set spring tension evenly and correctly, and they won't slip.



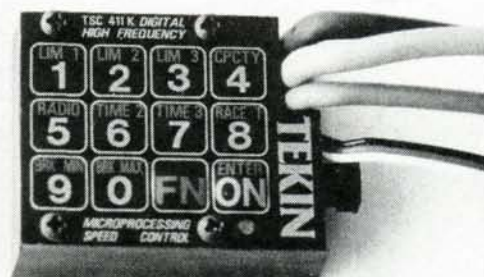
#### **KO Propo 1001 FET Servo**

Finding a good servo is difficult: if it's fast, it has no torque; if it's strong, it's slower than a salted slug. KO Propo offers a servo with mind-blowing speed and Herculean strength! The 1001 FET servo has a 60-degree transit time of .07 seconds, 90 ounce/inches of torque with 7.2 volts and 104 ounce/inches of torque with 8.4 volts. Wimpy servo-savers need not apply!

#### **Tekin 411K Speed Controller**

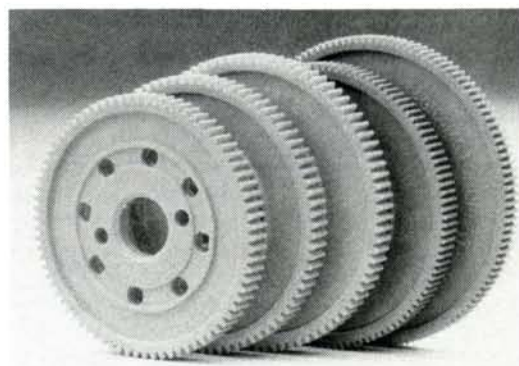
Just when you thought you owned the hottest speed controller on the market—you know, the one with gold FETs, high-frequency motor drive and adjustable torque control—Tekin introduces the new 411K. It has all of those things and a digital, computerized microprocessor; a digitally

programmable torque control; a dumpless mode; a new spin-control-type braking circuit; and an audible chime that verifies that the unit is on!



#### **Magic Motorsports Magic Gears**

Magic Motorsports' narrow-profile gears fit the Associated Stealth and Traxxas TRX-1 trannies. They're molded of a composite material that resists chipping, and they're perfect for pan cars that have ceramic diff rings.

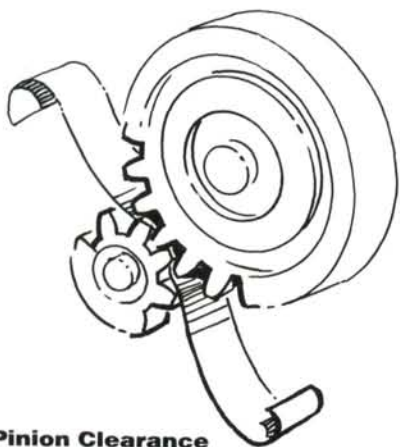




# TOP 10

## PIT TIPS

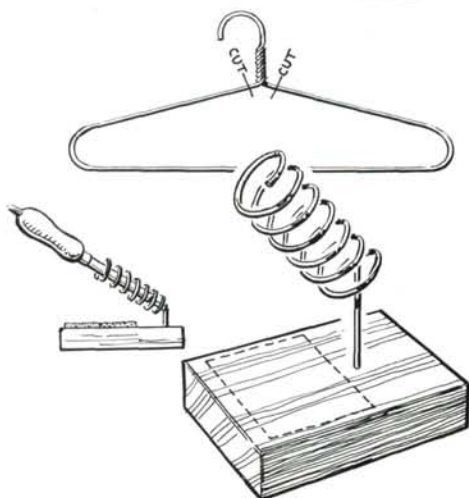
*Pit Tips are helpful hints and ideas that make life with R/C cars a little less frustrating. Every month, our readers flood Jim Newman with ideas that he brings to life with his superb technical illustrations. Everything, from how to avoid having leaky shocks to how to repair a ripped body, has been covered by a "Pit Tip." We've selected the year's top 10, so read on—and learn!*



### Pinion Clearance

Feed a narrow strip of paper between the spur gear and the pinion before you tighten the screws. The paper will provide enough mesh and a proper clearance so that you can adjust the gears to run smoothly. Remove the paper after you've set the clearance, of course!

Peter Yang, Downey, CA



### Soldering-Iron Rest

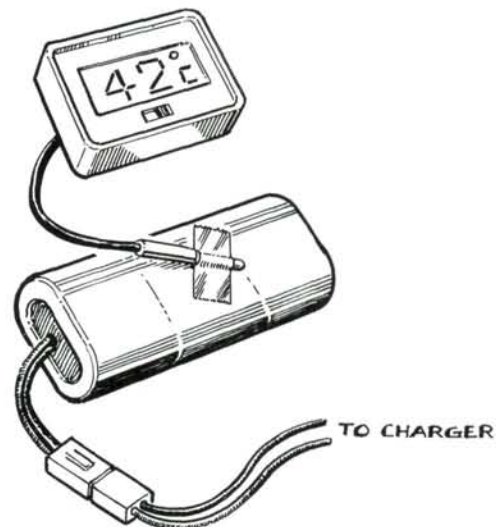
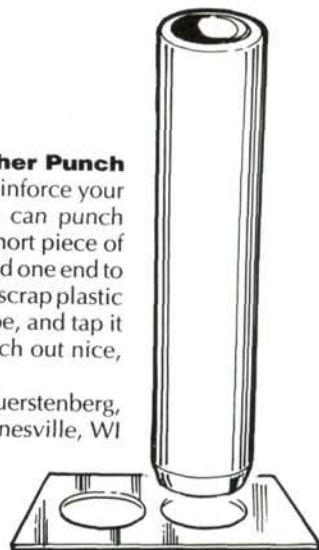
The humble coat hanger, yet again!—this time, for a handy soldering-iron rest. Coil the wire around a large dowel, cut it to the correct length, then use CA to glue one end into a wooden base. Glue a foam sponge in the area shown by the dotted line. Kept moist, the sponge is ideal for wiping the iron's tip.

Steven Dong, Staten Island, NY

### Washer Punch

Do you need plastic washers to reinforce your body shells? With this tool, you can punch them out of scrap plastic. Buy a short piece of steel pipe, and carefully file or grind one end to make a sharp cutting edge. Put the scrap plastic on a hard surface, position the pipe, and tap it firmly with a hammer. It will punch out nice, clean washers.

Jerry Fuerstenberg,  
Janesville, WI

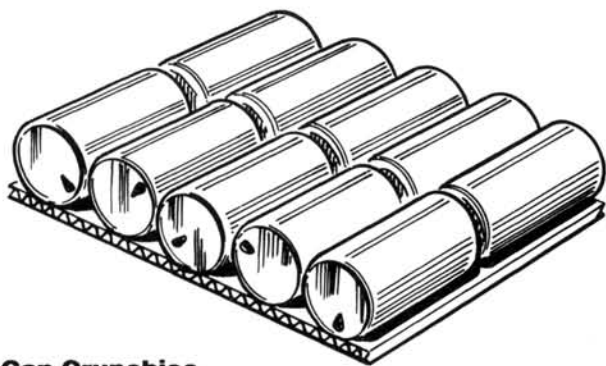


### Thermal Charging

After a battery pack has been broken-in, you can go to thermal charging if you don't own a peak charger. Lavco says you can charge a pack at 4 amps until it reaches 42 degrees centigrade (108 degrees Fahrenheit) in a temperature of 70 to 90 degrees Fahrenheit. Tape a Radio Shack digital thermometer (part no. 277-123) to the pack as shown, and watch it until the pack reaches the required temperature. You could also rig the thermometer to activate a buzzer, which is also available from Radio Shack.

Chris Stratton, Hemet, CA

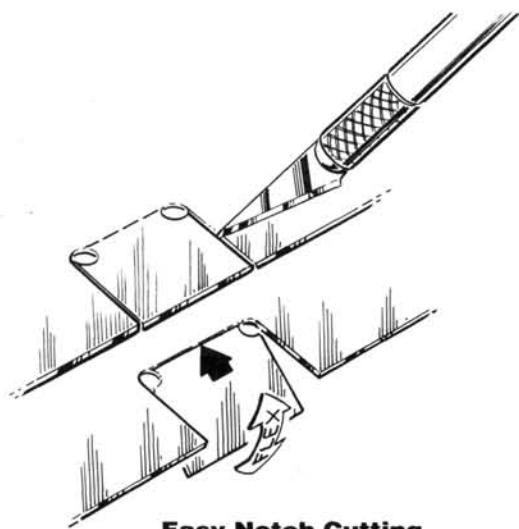




### Pop-Can Crunchies

If you don't have a stock of old car bodies to crush, try this. Save your soda cans, glue them onto cardboard and make a suitable ramp out of scrap plywood, etc. Four rows of 20 cans makes a great "crusher course."

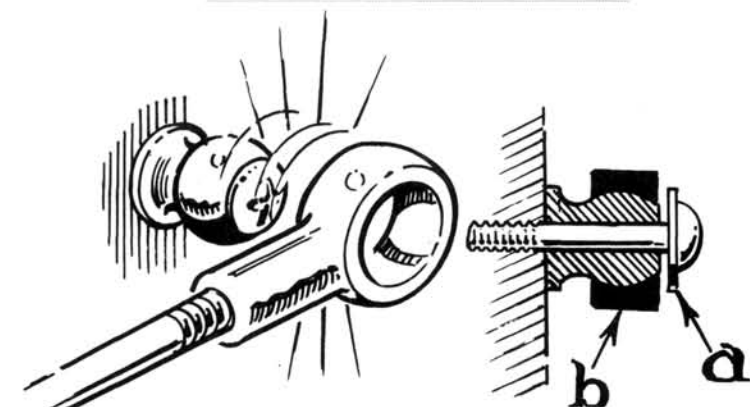
Clay Berry, Kettering, OH



### Easy Notch Cutting

This tip will make it easier to trim polycarbonate bodies. Drill two  $\frac{1}{16}$ - or  $\frac{3}{32}$ -inch-diameter holes as shown. Cut up to the holes, then score carefully between them using a sharp hobby knife. After you've moved this "tab" up and down a few times, the plastic will pop out cleanly.

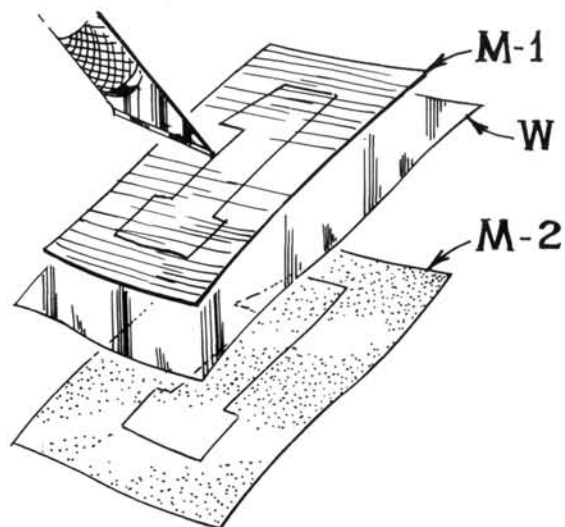
Lionel Chin Yew Wah, Singapore



### No-Pop Ball Joints

This tip was originally devised to prevent the trailing arms on a JR-XT from popping off, but it will work on any ball joint. Put a washer (a) that's larger than the hole in the ball socket (b) on the screw that secures the ball joint. This prevents the socket from popping off the ball.

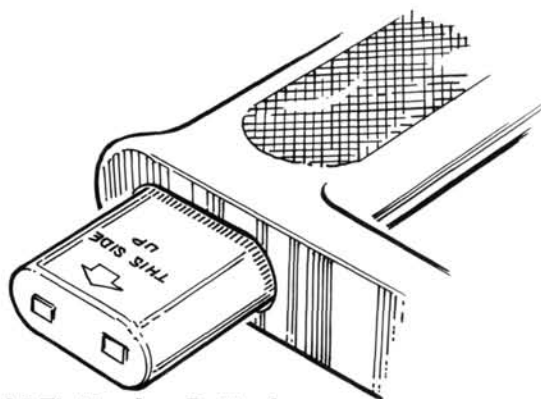
T. Bray, St. Charles, MO



### Inside Masking Numbers

"W" is waxed paper; "M-1" is masking tape with the sticky side facing downward; and "M-2" is masking tape with its sticky side up. Cut right through all three, then use only the number cut out of M-2 to mask the inside of the body shell, since its adhesive is on the right side.

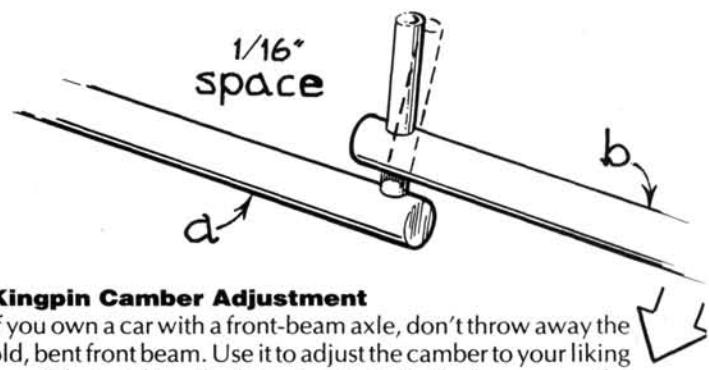
Gerry Lamother, Easthampton, MA



### Avoid Flattening Batteries

Do you find that your transmitter gets turned on accidentally while you're transporting it? To avoid having flat transmitter batteries, install the pack upside-down (shown), and then install it properly when you reach the track.

Jason Schneider, Anaheim, CA



### Kingpin Camber Adjustment

If you own a car with a front-beam axle, don't throw away the old, bent front beam. Use it to adjust the camber to your liking by safely tweaking the kingpins. Just slip the beam over the kingpin (allow  $\frac{1}{16}$  inch of space underneath), and then bear down on the beam to bend the pin outward slightly.

Bruce Triplett, Augusta, GA

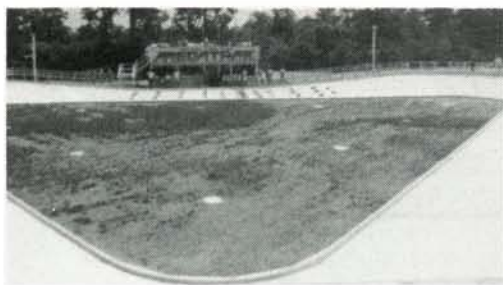
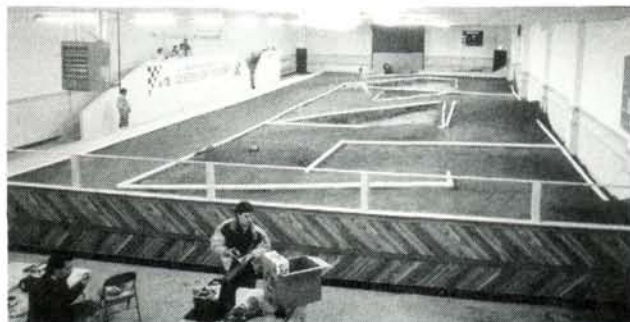


# TOP 10 TRACKS

HERE ARE our top 10 track choices. We've tried to choose the best off-road, on-road, paved-oval and dirt-oval tracks—not an easy assignment, given the large number of tracks in the world. The tracks that we've picked have a lot to offer. Visit one if you can. You won't be disappointed.

## QUEENS OFF-ROADERS 42-12 13th St., Long Island City, NY

Believed to be the largest indoor off-road track in the world, the Queens Off-Roaders boasts a challenging 160x57-foot track that has a new layout every three months. There's pit space for 230 racers and four AC outlets for each racer. An AMB computerized lap counter is also used, and a large scoreboard tells the crowd the leaders' positions, the time left in each race and how long they have to wait for the next one. Spectators can watch the action from the glass-enclosed snack bar/hobby shop that's above the track. James Lee and his brother, John, are committed to giving racers the ultimate off-road experience. Check it out for yourself!



## MEGATRAK Rt. 70, Browns Mills, NJ

When it comes to high-speed oval racing, Megatrak is *the* place on the East Coast. This tri-oval has a center line of 410 feet, a 175-foot main straight and two 145-foot straights. Turns one and three are banked equally, but they have different driving lines, which makes the track more challenging to the experienced racer. An AMB lap-counting system is permanently installed at the track with the transponder loop buried beneath the track's surface.

Come race with the pros! This large indoor facility contains an awesome clay, off-road track, a full hobby shop, AC power for all racers and even an on-site snack bar for hungry transmitter jockeys. At RCH, you're likely to run into top drivers such as Cliff Lett, Mark Pavidis and Brian Kinwald—all of whom use the RCH facility to hone their driving skills and test the latest in high-tech racing goodies. Also, RCH has become the home of the annual Reedy Race of Champions, where drivers from around the world gather to compete for the prestigious title of Invitational Champion.



## RADIO CONTROLLED HOBBIES RACEWAY 2011 Placentia Ave., Costa Mesa, CA



## SKY CIRCUIT 1945-7, Hane, Hamuramachi, Nishitamagun, Tokyo, Japan

Sky Circuit is Japan's largest banked-oval R/C track. The 113x53-foot track has 15-degree banked turns. Kazuhiro Ozaku, the president and owner of Sky Circuit, finds American R/C oval racing "really hot and very interesting." He wants oval racing in Japan to rival that of the U.S. The All-Japan R/C Oval Race Series will include contestants from all over Japan. Mr Ozaku said, "It's very important to have a full line of optional parts and accessories. I plan to import American parts and kits that aren't yet available in Japan." Think of it: Japanese car buyers are going to buy American!



### HELLTRAK

**1313 Mockingbird Ln., Bedrock, B.C.**

Want to test your mettle? Try making just one lap on HellTrak! If the rubble traps don't get you, the dreaded pool of spent oil will. The owners of HellTrak (who wish to remain anonymous) reportedly plan to make a bid to host the '93 Off-Road Nationals, but ROAR officials deny any allegations of kickbacks given to them by HellTrak that may influence their decision. The track is open Monday through Tuesday from 12 a.m. until dawn. There's no full-service hobby shop within 100 miles, no AC power, no drivers' stand and no AMB Autocount system. There is, however, plenty of free parking.



### SEMROCC WORLD'S TRACK Freedom Hill Park, Sterling Heights, MI

Site of the '91 IFMAR Off-Road Worlds, the SEMROCC track features a clay base that's covered with 4 inches of sand for drainage. The racing surface consists of 8 inches of sifted, processed topsoil, and grass grows around the track. The width of the lanes varies between 8 and 14 feet—a very enjoyable drive. To give the drivers an unobstructed view, there's a 32x8-foot drivers' stand.



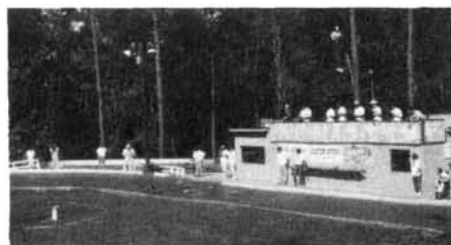
### RANCH PIT SHOP RACEWAY 1655 E. Mission Blvd., Pomona, CA

Formerly Thorp Raceway, the Ranch is enjoying its 11th year of successful racing. Featuring both on- and off-road tracks, the Ranch is the first commercial R/C race track to turn a profit. Originally contained in a 1,500 square-foot area, the tracks now take up 6,000 square feet—quite an enlargement! Topping the list of significant races held at the Ranch were the first-ever, 1/8-scale Worlds held in 1977 (and again in 1987) and the first 1/10-scale IFMAR Off-Road Worlds held in 1985. This July, the Ranch will be the site of the first 1/10-scale On-Road World Champs.



### AMERI-TRAC SUPER SPEEDWAY Rte. #3, Box 242, Mattoon, IL

Ameri-Trac, a concrete tri-oval, was established in June 1990. It features a 400-foot center line; 16-foot-wide lanes; 12-, 10- and 8-degree banked turns; and a main straight that's more than 120 feet long! A 40-foot-long drivers' stand (with handicap access) ensures that all racers will have a good view of the track. An AMB lap-counting system is housed in a separate building next to the track. The pit area is equipped with AC outlets, and it can accommodate up to 300 racers. Country Corner Hobbies, a well-stocked R/C shop, is next to the track.



### SUGAR BOWL SPEEDWAY 5272 North Ave., Sugar Hill, GA

The Sugar Bowl is one of the finest dirt-oval racing facilities in the world! Owned by the Bailey family (Chris, Shelley and Jan), it features a concession stand and a stocked hobby shop. The tri-oval track is over 350 feet in diameter, and its damp clay surface is so smooth that straight-axle pan cars are the choice of most racers. Should you choose to journey to the Sugar Bowl, you'll find ample pit space and parking.

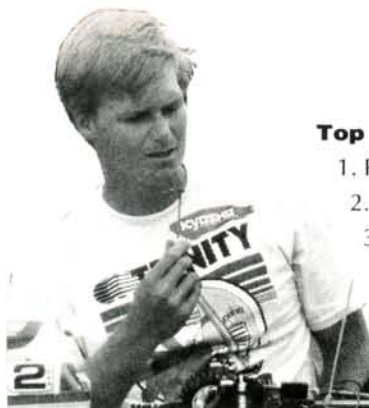


### YATABE ARENA 4385-2 Midorigaoka, Tsukuba-City, Ibaraki Prefecture, Japan

Yatabe Arena is the only indoor off-road track in the world that features a roof that can be opened in nice weather! It's owned by Yokomo and, in addition to hosting most of the largest off-road races in Japan, it doubles as Yokomo's test track. The arena also has an on-site hobby shop/drivers lounge and ample parking.



YEAH, SO maybe we're getting bored with the same old categories in our annual "Top 10" issue. So maybe we don't have enough work to do. So maybe we actually came up with something to amuse ourselves besides the daily rubber-band war or trying to get the Managing Editor, Ms. Li, so mad that she'd hit us with the Yardstick of Discipline. So maybe this is what we came up with. So sue us!



#### Top 10 Reasons Joel Johnson DNFs

1. Pinion falls off
2. Battery falls out
3. Blonde walks by
4. Pinion falls off
5. Battery falls out
6. Brunette walks by
7. Pinion falls off
8. Battery falls out
9. Redhead walks by
10. During the race, he suddenly realizes that his hair will never be as cool as Chris Chianelli's.

#### Top 10 Things We're Tired of Reading in "Letters"

1. "My friend and I have identical cars, but he always wins. Why?" (Have you tried practicing, perhaps?)
2. "Which is better?" (Gee, have you tried reading the magazine?)
3. "My name is \_\_\_\_\_, and I'm \_\_\_\_\_ years old." (We note with interest that our readers stop telling us this once they hit 17 or so, but start up again at 40.)
4. "Write back to me, because I don't buy every issue." (You dare to *admit* something like that?)
5. "Call me at home." (Sure, no problem.)
6. "Chris Chianelli is my idol." (Really, we're very sorry.)
7. "Next thing I knew, I had a fire." (Don't ask....)
8. "What do you do with the cars when you're finished reviewing them?" This one is always followed by:
9. "Can I have one?" (No, you can't. Stop asking.)
10. "I *know* I could beat Cliff Lett if I just had the right batteries." (Right.)

#### Top 10 Reasons why your "Readers' Rides" Submission was Rejected

1. Your car looks as if it has been devoured by grass.
2. Your thumb was over the camera lens.
3. The car didn't *quite* make it into the photo.
4. The photo showed your car causing innocent bystanders bodily harm.



5. There were naked people in the photo. (You can keep sending these; just don't expect to see them in print!)
6. You insulted the Ayatollah, *and* you made the stupid mistake of including your return address.
7. Your letter was addressed to Del. (Just what color *is* the sky in your world?)
8. Your paint job looks like it was done by a lobotomized opossum.
9. Your car has been used in satanic rituals.
10. Doesn't it say right there, every month, in large print that we *can't* use Polaroids? Jeeez....



# STILL MORE TOP 10

#### Top 10 Shows ON ESPN We'd Like to Replace with R/C Racing

1. World-class Ping-Pong
2. Bowling
3. Billiards
4. Volleyball
5. Sunkist Kids
6. Celebrity skeet shooting
7. Bill Dance's Great Outdoors
8. *Any* fishing show
9. Professional curling
10. Westminster Dog Show (*that's* a sport?)

#### Top 10 Things Chris Chianelli uses in his hair

1. Cool Whip dessert topping
2. Miracle-Gro plant food
3. Zap-a-Dap-a-Goo
4. Associated 40WT shock oil
5. Joyce Chen soy sauce
6. Trinity Nuclear Waste
7. Litespeed Dy-Lon
8. Jammin' Jay's Diff Lube
9. Rogaine with Minoxidil
10. Chia seeds





CAR ACTION and  
Custom Works  
sponsor

U.S.  
Open-  
Wheel

# Dirt Oval Championships

by JOHN RIST

N / A / K / E / D





I'VE DISCOVERED  
the formula for a  
great weekend:

warm, sunny, October  
weather; an extremely well-  
prepared,  
silky-smooth,  
high-speed  
dirt tri-oval;  
and world-  
class drivers  
vying for the  
title of U.S.



Dirt Oval Champ! This is  
what I found in Sugar Hill, GA  
(just outside Atlanta), during  
the Car Action/Custom Works  
U.S. Open-Wheel Dirt-Oval  
Championship.



PHOTOS BY JOHN RAST

R | U | B | B | E | R



# Dirt Oval Championships

Here, Michael Burke gets his "torn down" motor back. Although the motor is destroyed to verify that it's legal, each participant receives a new one.



## THE TRACK

The Sugar Bowl R/C Speedway is situated amidst pine trees on the side of a hill. Shelly Bailey (owner, race promoter and true friend of R/C car enthusiasts) has done an incredible job creating a first-class racing facility in what was once nothing but a thicket.

The amenities include a high-speed clay tri-oval, an off-road dirt course, two drivers' stands, rest rooms, a lighting system that permits night racing, a hobby shop and a snack bar. An automatic lap-counting system and a transmitter impound are housed under the drivers'

stands. As if this weren't enough, there are 115V AC outlets throughout the parking/pit area.

## FIRST, SOME HISTORY...

Open-wheel dirt-oval racing has its roots in the days when horse racing fulfilled man's need to go fast. Two types of car racing started and grew on the first dirt fairground and stadium tracks: sprint car and stock car. As the need for more speed invaded the sport, outlaw sprint cars became narrower and acquired roll cages (to protect the

drivers) and huge upper wings. To reduce weight, stock car drivers cut off their cars' front fenders and trimmed off most of the rear ones. This "hatchet job" transformed stock cars into modified open-wheel cars.

The large-wing, open-wheel configuration has been copied in miniature to create R/C open-wheel dirt-oval racing. Spectators enjoy this type of racing because the very high speeds at which the cars race often results in wild crashes.

## RULES OF THE ROAD

The three-day event began on Friday, October 24, 1991, but the racing actually started on Saturday with two qualifying rounds. The final round of qualifying and the Mains were held on Sunday.

The event used ROAR rules, and it consisted of four classes: Sprint-Car and Modified-Body, both of which had Stock- and Modified-Motor Classes. The Stock Classes used 6-cell battery packs; the Modified, 7-cell packs. Race director Robert



## A Special Guy

Owing to space considerations, when we cover national events, we usually concentrate on the races—specifically, the A-Mains. Unfortunately, there isn't much room to write about the participants, many of whom have unusual backgrounds and stories to tell. Greg Thompson of Gainesville, GA, was one such participant at the Dirt Oval Champs, and his story is so inspiring that I had to include it here.

Although he was in the later stages of multiple sclerosis (MS)—a disease that affects the central nervous system—Greg was a successful participant. He had lost the use of one of his hands and both of his legs, so he drove his car from a wheelchair. (I joked with him, telling him that his victory was

guaranteed if he could find a way to fit his wheelchair battery into his R/C car!) Two of Greg's friends, Jonathan Demuth and Jay Bowling, helped him drive. One of them worked the trigger while Greg handled the steering. Greg finished 3rd in the B-Main with 28 laps—an amazing feat when you consider that the A-main laps ranged from 28 to 31. Greg proved that he could run with the best!

Jan Bailey (co-owner of the Sugar Bowl R/C Speedway) called on November 19, 1991 to tell me that Greg had died. The R/C racing world, especially the drivers who hang out at the Sugar Bowl, will miss him. I feel fortunate to have met Greg and to have watched him race, and I dedicate this article to his memory.



# Dirt Oval Championships

Belew worked hard to ensure that everyone followed the rules. Technical inspections were held before every race. Darton Kines, who was in charge of these inspections, used templates to check width and length, a digital

thoroughly inspected for signs of tampering. As you've probably guessed, no one used an illegal motor.

## WHO WAS THERE?

Two major factory teams came to battle for the position of king of the mountain—

Custom Works with its Dominators and Enforcers; and Trinity with its ReFlex 10 chassis.

## Modified-Body Stock-Motor Class

Fin.	Qual.	Name	Chassis	Motor	ESC	Batteries	Radio	Body
1	3	Clay Phillips	Oval Works		Tekin 411P	A&D Select Cells	Futaba	Bolink Probe
2	6	David Wragg	Intimidator	H	Tekin 411P	Mustang	KO Propo	Custom Works
3	7	Michael Burke	Intimidator	F A	Novak T1X	Mustang	Futaba	Custom Works
4	5	Junior Stroud	Oval Works	A N	Zeta	PTI	Futaba	Bolink Probe
5	8	Jason Maxwell	Oval Works	N D	Novak	Mustang	Airtronics	Bolink Probe
6	9	Wayne Southard	Intimidator	T	Tekin 411P	Max-Cell	Futaba	Custom Works
7	1	Toby Hammonds	Bolink LTO	O O	Tekin 411P	Mustang	Futaba	Custom Works
8	2	Slade Jarrett	N/A	M U	Tekin 411P	Mustang	Futaba	Custom Works
9	4	Byron Sartain	Oval Works	T	Zeta	Trinity Pushed	Futaba	Bolink Probe
10	10	Ronnie Royston	Scratch-built		Novak 410 MXc	Mustang	Futaba	Custom Works

## Sprint-Car Stock-Motor Class

Fin.	Qual.	Name	Chassis	Motor	ESC	Batteries	Radio	Body
1	2	Bill Lees	Scratch-built		Novak	B&T	Futaba	N/A
2	1	Jay Wood	Losi	H	Tekin 411P	Light Speed	Futaba	Big Boy Eclipse
3	3	Wade Lichtenberg	Losi	F A	Tekin 411P	Team Smooth	Futaba	Big Boy Eclipse
4	6	Willis Lancaster	B&R	A N	Tekin 411P	Sassy Punch	Futaba	Big Boy Eclipse
5	8	Michael Slavens	Losi JR-X2	N D	Tekin	Sanyo	Futaba	Ascot
6	9	Gene Gideon	Losi	T	Novak M1c	S&K	Futaba	Premier
7	7	Larry Suppenback	B&B Coyote	O O	Novak	SWR	Airtronics	Coyote
8	4	Cecil Collins	Losi JR-X2	M U	Novak T1X	PTI	Futaba	Bolink
9	10	Brian King	RC10	T	Novak T-4	Mustang	Futaba	Outlaw Sprint
10	5	Gary Coker	RC10		Tekin 410S	Mustang	Futaba	Bolink

## Modified-Body Modified-Motor Class

Fin.	Qual.	Name	Chassis	Motor	ESC	Batteries	Radio	Body
1	4	Bob Light	Intimidator	Specialized	Novak	Power Products	KO Propo	Custom Works
2	6	Brian Landgraff	Intimidator	Trinity	Novak	Trinity	Kraft	Custom Works
3	2	Darrell Winslett	Intimidator	East Coast	Tekin	Mustang	Futaba	Custom Works
4	5	Rob Cutman	Intimidator	Trinity 13x5	Novak 410MXc	Trinity	KO Propo	Custom Works
5	7	Tye Gaskin	Intimidator	East Coast	Novak 410MXc	Mustang	Airtronics	Custom Works
6	10	Gene Gideon	ReFlex 10	CAM	Novak 410MXc	S&R	Futaba	Bolink
7	8	Ricky Jordan	Bolink LTO	CAM	Novak	PTI	Futaba	Pupello
8	TO	Jim Dieter	ReFlex 10	Trinity	Novak	Trinity	KO Propo	Scratch-built
9	3	Randell Winslett	Bolink LTO	East Coast	Tekin	Mustang	Futaba	Custom Works
10	9	Ron Moore	Custom Works	LightSpeed	Tekin	Light Speed	Alpine	Custom Works

## Sprint-Car Modified-Motor Class

Fin.	Qual.	Name	Chassis	Motor	ESC	Batteries	Radio	Body
1	2	Richard Durnell	ReFlex 10	Revtech	Novak MXc	CAM	Futaba	ReFlex 10
2	4	Bill Lees	Scratch-built	Trinity	Novak	B&T	Futaba	N/A
3	9	Ron McCreery	RC10 Big Boy	Trinity	Tekin	Trinity	Airtronics	McAllister
4	7	Jim Schrock	ReFlex 10	Fantom	Tekin	Fantom	Futaba	Big Boy
5	6	Donald Cunningham	Enforcer	LightSpeed	Novak	LightSpeed	JR	Big Boy
6	1	Jim Dieter	ReFlex 10	Trinity	Novak	Trinity	KO Propo	Scratch-built
7	5	Lee Cunningham	Enforcer	LightSpeed	Novak MXc	LightSpeed	Kraft	Big Boy
8	3	Mike Berter	ReFlex 10	Trinity	Novak	N/A	N/A	N/A
9	10	Gene Gideon	ReFlex 10	CAM	Novak MXc	S&K	Futaba	Premier
10	8	Mike Martin	Scratch-built	Fantom	Novak	Trinity	Futaba	McAllister



Technical inspector Darton Kines (left) prepares to check out Gene Gideon's modified-motor sprint car (the ReFlex 10 TXO chassis).

scale to check weight and a keen eye to check for other things that might have violated the rules.

Race officials also used an elaborate system to verify that the motors used in winning Stock-Class cars were truly stock! The cars of the top finishers in each class were impounded after the race. The motors were removed so that officials could check that the serial numbers (issued before they were handed out) matched those on the registration list. Then, the motors were



Left: winners of the Modified-Body Stock-Motor Class (left to right): Toby Hammonds—TQer; Shelly Bailey—track owner; Clay Phillips—1st place; David Wragg—2nd place; Michael Burke—3rd place. ■ Right: winners of the Sprint-Car Stock-Motor Class (left to right): Bill Lees—1st place; Shelly Bailey; Jay Wood—TQer and 2nd place; Wade Lichtenberg—3rd place.





All the team members were more than willing to discuss the latest tricks or lend a hand with a problem (especially if

you were driving one of their chassis).

I also saw Team Associated

(Continued on page 67)



Tires F/R	Sponsors
Oval Works skins red/red	Oval Works, R/C Graphix, Tekin, A&D Select Cells, Image Racing Products
Custom Works green/yellow	East Coast Racing Motors, Mustang Batteries, Wragg's Racing
Custom Works blue/green	CKB
Oval Works skins	Sartain Racing, Oval Works
Oval Works skins red/red	R/C Graphix, Mustang Batteries, Oval Works, Airtronics
Custom Works green/yellow	Mustang Batteries
ETA Silicone	Twister Motors, Max-Cell Batteries
Custom Works blue/yellow	East Coast Racing Motors, Mustang Batteries, Wragg's Racing
Oval Works skins	Sartain Racing, Oval Works
Oval Works skins red/red	Visa/Mastercard & Understanding Wife

Tires F/R	Sponsors
HPI Silicone medium/medium	Wife, Visa, Teammates
Cust. Wks. (R)blu.(L)grn./yell.	Visa, American Express, Teammates
Custom Works blu-grn./yell.	N/A
TRC Silicone green/green	N/A
Losi green/green	Action Hobby Shop, R&R Hobby/ReFlex 10
Losi foam silicone	Suppenback Winter Racing, Hadrissonville Hobby
TRC yellow/yellow	Debco Enterprises
Oval Works red/red	Mustang Batteries, Brian King
Silicone green/green	Coker & Coker Inc., Triple M Racing
Silicone yellow/yellow	

Tires F/R	Sponsors
Custom Works green/yellow	Specialized R/C Motorworks, Power Products, Custom Works, Novak, Du-Mor R/C
Custom Works yellow/yellow	Custom Works, Trinity, Novak, Du-Mor R/C, Scat
Custom Works yellow/yellow	Mustang Batteries, RC Enterprises, East Coast Motors, Bolink
Custom Works green/yellow	Custom Works, Trinity, Novak, Do-Mor, Scat, Technacraft, R&D Hobbies, Autographics
Custom Works green/green	Custom Works, Mustang Batteries
Losi Silicone	Action Hobby Shop, R&R Hobby/ReFlex 10
Bolink yellow/yellow	Bolink, CAM, PTI, Futaba, Pupello Motorsports
TRC Silicone	R&R Hobby/ReFlex 10, Trinity, Novak, TRC
Bolink yellow/yellow	Mustang Batteries, RC Enterprises, East Coast Motors, Bolink
Custom Works blue/yellow	

Tires F/R	Sponsors
Losi silicone green/yellow	Jim Dieter
Losi green/yellow	N/A
Silicone green/green	Harold Cushing Hobby House
TRC green/yellow	Fantom Racing, Endurance Racing Products
Custom Works green/yellow	Team Riverside Racing, Raborn Racing Originals, Lightspeed Racing Products
TRC silicone	Trinity, R&R Hobby/ReFlex 10, Novak, TRC
Custom Works green/yellow	Team Riverside Racing, Raborn Racing Originals, Lightspeed Racing Products
Silicone	R&R Hobby/ReFlex 10
Losi silicone	Action Hobby Shop, R&R Hobby/ReFlex 10
Bolink	Triple M Racing

## ONLY THE tough WIN

As far as I know, the race results weren't affected by protests, but the Car Action/Custom Works U.S. Open-Wheel Dirt-Oval Champs wouldn't have been a "true" event without a few complaints.

At the drivers' meeting Saturday morning, someone pointed out that the winglets used on the front of some modified-body stock-class cars were illegal. The owners of the offending cars argued that they should have been told about this on Friday (practice day), because it would have given them time to adjust to driving without them.

On Sunday afternoon, when the track became slightly slippery and the sun was in the drivers' eyes, there were more beefs. It seems that some racers didn't stop to think about how difficult it is to keep a clay track in perfect condition for three days of racing. They were also so worried about the problems caused by glare, that they forgot to be thankful for the beautiful weather. Everyone had to contend with the same difficulties, but some people forgot one of the basic racing principles: when the going gets tough, the tough get winning!



Left: winners of the Sprint-Car Modified-Motor Class (left to right): Jim Dieter—1st place; Shelly Bailey—track owner; Richard Durnell—2nd place; Bill Lees—3rd place; Ron McCreery—4th place. Right: winners of the Modified-Body Modified-Motor Class (left to right): Jim Dieter—1st place; Shelly Bailey—2nd place; Brian Landgraaf—3rd place; Darrell Winstlett—4th place.



# SCOPING OUT

by JOHN RIST

## SCI Power Card

**W**HAT LOOKS like a credit card but offers motor power instead of buying power?—the SCI\* Power Card. The minute I opened the package, I realized that I was looking at an unusual speed controller (ESC). It's very thin, but fairly wide and long, so it resembles a credit card, and that's probably how it got its name. A quick check of the instruction sheet revealed that this is a forward-only-with-brakes-style ESC. The SCI Power Card has these features:

- five FETs for forward and one for brakes;
- high-voltage FETs that allow the use of 4 to 40 volts (four to 32 cells);
- Tamiya-style battery and bullet-style motor connectors;
- a set of plastic adapters to convert the receiver plug to any of the popular radio systems;
- built-in BEC;
- a unique one-potentiometer (pot) pulse adjustment and a two-color LED pulse checker;
- a heat sink that's part of the case;
- an instruction sheet and a hot set of SCI decals.



The unusual shape of this controller was enough to make me want to open the case to look inside. I took out two Allen-head, self-tapping screws from the bottom, and with the controller out of the case, I could see how SCI achieved its unique shape. The FETs lie flat on the bottom of the case. To dissipate heat and to help carry the current, the heat-sink tabs are welded to a copper base plate. There are actually two printed-circuit

(pc) boards, one lying next to the copper substrate and the other right above it. The bottom pc board is solid and copper clad, and it acts as a bus to carry the heavy current. The upper pc board isn't unusual and contains all the parts needed for the BEC, pulse checking and control circuitry. The Power Card is definitely different, but it seems to be

very sturdy and should stand up well to the rough-and-tumble life it will lead when it's mounted in the middle of your favorite R/C vehicle. Just how well will this uniquely shaped, sturdily built ESC run in a buggy?

### AT THE LAB

I headed to the "Scoping Out" lab to pump some current and take some read-

*(Continued on page 64)*

## "SCOPING OUT" LAB AND TESTS

### • THE LAB consists of:

- an oscilloscope
- a digital voltmeter
- a variable-load resistor bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm 5W power resistors that can be switched on and off one at a time to vary the load between 6 amps and 20 amps, but the

standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent 0.01-ohm resistor. By measuring the voltage drop across this resistor, the current meter's reading can be double-checked. Of course, the lab power supply provides the test current.

• **VOLTAGE-DROP TESTS.** These are the first tests. It's virtually impossible to read an ESC's resistance directly, so I measure the voltage drop across it with the resistor bank set up for 12 amps of current. I then calculate the controller's "on" resistance by dividing the measured voltage drop by 12 amps. I take the voltage reading twice: along the full length of the battery and motor wires (including con-

nectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

• **LET-IT-COOK TEST.** I adjust the resistor bank to pass 20 amps of current, then I jam the throttle wide open and let the ESC pump the 20 amps.

• **DEAD-SHORT TEST.** With this test, I check whether the controller can survive the heavy current caused by a jammed gear or a fried motor. No one likes to have this kind of trouble and discover that his ESC has been destroyed, too.



(Continued from page 60)

ings. The first step was to get the Power Card operating properly. It has only one adjustment pot instead of the usual two, and its function wasn't clear because it isn't written on the case. The one-page

direction until the LED goes off. After that, rock the pot adjustment back and forth a little to make sure that you're just on the edge of turning on the yellow brake LED.

## SCI POWER CARD

### DIMENSIONS:

Height ..... 0.30 inch  
Width ..... 1.62 inches  
Length ..... 2.53 inches  
Weight with wires ..... 2 ounces

### TUNING:

Access to controls ..... Excellent  
Ease of adjustment ..... Fair

### PRICE:

Sug. price ..... \$179  
Warranty ..... 6 months

### ELECTRICAL: (Manufacturer's specs)

Max voltage ..... 40 volts (32 cells)  
Min voltage ..... 4 volts (4 cells)  
Max current ..... 1000 amps

Continuous current ..... 260 amps  
Resistance ..... Not listed

### TEST PARAMETERS:

Voltage ..... 6 volts  
Current ..... 12 amps  
Voltage drop along  
length of wire ..... 0.28 volt  
Voltage drop 2  
inches along wires ..... 0.16 volt  
Resistance to  
end of wires\* ..... 0.023 ohm  
Resistance 2  
inches along wires\* ..... 0.013 ohm  
BEC voltage,  
6-cell pack ..... 5.96 volts  
\*Calculated resistance = voltage drop/current

### COMMENTS:

SCI of Austria has come to the USA with a line of exciting ESCs. Its Power Card has a 32-cell voltage rating (40 volts) and five FETs to handle the current. During the lab tests, there was some overheating, but the Power Card withstood all abuse and, mounted on a car chassis, it ran coolly. The Power Card has only one pot to match it to the transmitter, but full throttle can be obtained by adjusting the neutral trim pot and playing with the transmitter throttle trim. The instruction sheet is skimpy, but adequate (a newcomer might need help). If you plan to use this ESC for serious racing, the SCI-installed Tamiya/bullet-style connectors must go. This controller has the potential to operate well in almost any car, buggy, or truck that it will fit, but it will really shine in an Insane Class that permits more than the usual 6- or 7-cell packs. The SCI Power Card is first-class.

instruction sheet helped me to solve the mystery: the single adjustment pot is used to set neutral. The sheet also explained the absence of a second pot: the full-speed setting is set at the factory and doesn't require any further adjustment.

I applied battery juice, set my transmitter throttle trim to its middle point and rotated the trim pot on the ESC. The pot doesn't have an end of travel stop; instead, it will just keep turning and turning. This rotation is confusing and makes it a little difficult to set the pot. The trick is to watch the yellow LED, which indicates brake. Crank the pot clockwise until the yellow LED comes on. Then continue to turn it in the same

After that, I checked full-throttle operation with the oscilloscope and found that, indeed, the full-speed adjustment had taken care of itself. With the controller now set up and working it was time to start the lab test.

### VOLTAGE-DROP TESTS

I always check resistance first. With 12 amps of current flowing, the voltage drop along the length of the wires was 0.28 volt—a resistance of 0.023 ohm. Two inches along the wires, the voltage drop was 0.16 volt—a resistance of 0.013 ohm. This resistance is a little high, but high-voltage FETs (40 volts) tend to have slightly higher resistance.

## LET-IT-COOK TEST

The use of external heat sinks isn't an issue with the Power Card because its design doesn't permit their addition. The FETs lie flat and are welded to an internal copper plate that acts as the heat sink.

I set out to let the controller cook for 15 minutes, but after 12 minutes, it started glitching. I disconnected it and checked its bottom heat-sink plate; it was hot enough to hurt. After a short cool-down, the Power Card was again operating normally.

## DEAD-SHORT TEST

With the dead-short across the motor wires, I jammed the pedal to the metal and watched the current jump to 42 amps (the limit of my lab supply). I left the controller running for one minute, after which it was smoking hot and glitching severely. I tried to touch the bottom heat plate, but it was hotter than Georgia asphalt. I removed the short, let the Power Card cool to room temperature and found that it operated normally. It had survived all my lab abuses, so it was time to install the Power Card in a car and have some fun. (It was actually Christmas day.)

## CHRISTMAS (POWER) CARD!

We were expecting guests, and I knew they'd enjoy running my Kyosho Sideways, so I installed the Power Card in it. With its bigger-than-usual wheels, the Sideways runs well on grass, pavement, or dirt, so it's ideal for the yard and driveway.

First, the installation: this was quite easy because the Power Card comes with a complete set of connectors installed. The battery wires were about the right length, but the motor leads were a little shorter than I like. Generally, I whack off the bullet-style motor connectors and hard-wire my motor, but the motor leads were too short to do this.

As an alternative, I dug out a set of bullet-tipped motor wires and soldered them to the motor. The Sideways has lots of room on its top deck, so the Power Card's extra width and length didn't present a problem. Its large, flat bottom provides lots of area for the

(Continued on page 78)



# DIRT-OVAL CHAMPS

(Continued from page 57)

RC10s, Bolink LTOs, Team Losi JR-X2s, B&B Coyotes, Oval Works cars and many scratch-built cars. The rules allowed the use of gearboxes, direct drives and rigid rear axles (carpet pan-car style) or split axles for 4-wheel independent suspensions.

No one used magic or trick parts. Instead, the drivers exhibited incredible attention to detail and driving skills that only come with practice, practice and more practice!

## QUALIFYING

With a national title at stake, the quest for the A-Main was intense. If you bombed the first day, you had a night in which to recover. I arrived at the motel late Saturday evening and found several racers frantically stripping their cars down to the chassis plates and replacing gearboxes with direct-drive units. Many seemed to panic after the first day of qualifying, but not those on the Custom Works team.

Late Saturday afternoon, the Custom Works crew headed to the Dixie Speedway in Woodstock, GA, for a Saturday night race. This, of course, killed two birds with one stone. It allowed them to show off their Dominators at another track, and it gave them more time to practice!

## THE MAINS

In the A-Main, the title of Top Qualifier seemed to be the kiss of death; none of the TQ drivers won.

In the Sprint-Car Modified-Motor Class TQer Jim Dieter of Champaign, IL, had mechanical problems with his Titan TXO and was forced to retire early. First-place finisher Richard Durnell of Danville, IL, was followed by Bill Lees of Peru, IN. Third place went to Ron McCreery, of Phillipsburg, KS.

Jay Wood of Peru, IN, found himself in the TQ position in the Sprint-Car Stock-Motor Class. He was edged into 2nd (by a margin of 2.9 seconds) by fellow "Peruvian" Lees. Wade Lichtenberg of Valadosta, GA, took 3rd.

Dieter also TQ'd in the Modified-Body Modified-Motor Class, but he had mechanical trouble and was again afflicted with the dreaded DNF (did not finish)! Bob Light of Oklahoma City, OK, finished 1st; Brian Landgraaf of Bakersfield, CA, took 2nd; and Darrell Winslett of Atlanta, GA, took 3rd.

The Modified-Body Stock-Motor Class was the largest and most closely contended. TQer Toby Hammonds of Buford, GA, got caught in traffic and ended up in 7th place. Clay Phillips of Danielsville, GA, finished

(Continued on page 78)

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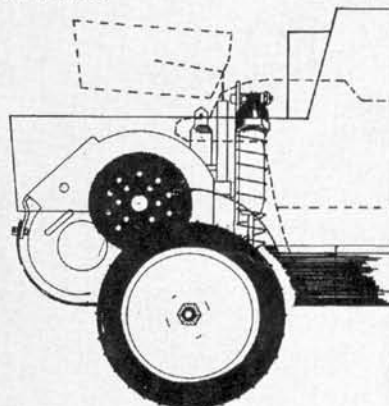
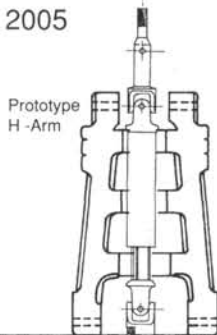
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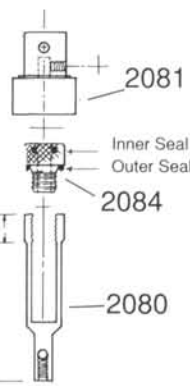
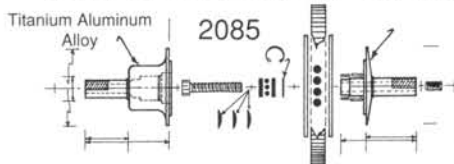
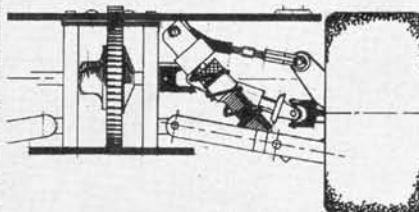
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# NITRO NEWS

by JEFF BRONSTEIN

## Club Med

**C**OMPETITIVE R/C racing may still be in its infancy, but anyone can enjoy the pure rush of racing excitement. (Not too long ago, "organized" racing consisted of toy cars kicking up dust in an empty lot!) Although I still get a kick out of driving my old Tamiya Blackfoot (one of the first of 20 plus R/C cars), there's nothing like going head-to-head with other racers.

The new generation of gas cars and trucks is especially good for racing, and the new 1/10-scale gas format could be the biggest thing to hit since DC current! If you're lucky, club racing is as close as your local hobby shop or municipal park. Sometimes, though it's hard to find clubs and tracks that are involved in gas racing because such events require more space.

If you don't have organized racing in your area, why not start your own club? Clubs can be very successful, and they

equally—no favorites, no pros and *no sponsored drivers*. Get as many people involved as possible, and then vote on the issues that will determine club's direction. Remember, no matter how hard you try, you can't please everyone. Do your best to make people happy, and don't let those who complain discourage you.

Be forewarned! It takes hard work and a lot of determination to create something from nothing. Even the Ranch Pit Shop—one of the most successful commercial tracks in the U.S.—began as a small group of dedicated slot-car racers. During the early stages, it may seem as if you're the only one who cares enough to do the tough jobs. It's common for 10 percent of the people to do 90 percent of the work. Don't let poor sports and slackers get you and the club down; they're usually the first to be weeded out. (I've found that the most active racers are generally the best drivers.) As long as there are five to 10 regular volunteers, the club will grow.

There's one down side to running a club: you have to give up some of your valuable track time to handle administrative duties. On the other hand, running a successful event can be very rewarding.

### STEPS FOR SUCCESS

- **Recruiting members.** Finding others who share your need for speed and your compulsion for competition is the easiest step on the long road to holding competitive events. You can find potential racers at hobby shops and toy stores, and there are many backyard warriors just waiting for someone to take the initiative! Hobby-shop owners are usually eager to help.



R/C racing has something for everyone, so it's everyone's responsibility to promote it.

Hanging notices or want ads on shop walls can attract countless interested racer "wanna-be's."

- **Finding a site.** After you've found the "who," you need to find the "where." Electric on- or off-road racing requires little space. Shopping malls, campgrounds and even some hotels will often let you set up a track in vacant areas of their parking lots. When you talk to the owners or managers of these establishments, point out that the races usually attract spectators who will frequent their shops and restaurants.

Gas racers may have a harder time finding sites. The larger, 1/8-scale cars require a minimum of 15,000 to 20,000 square feet of space, and you have to keep noise and safety in mind. With the right connections, you can find a suitable site. Ask city officials for permission to use space in a park for a racing site. R/C racing is the type of activity that city officials like to promote.

- **The track.** It takes time and effort to build and maintain a track, and everyone in the club should help. Off-road courses are usually semi-permanent, and they require only routine maintenance. They



Whether it's gas or electric R/C cars, most drivers like to race—many can't get enough of it! Work together with other clubs in your area.

often operate better than commercial tracks. If there's a hobby-shop track in your area, it's best for your club to establish a working relationship with it. A track owner who lets a club determine the racing format will make many racers happy.

Everyone in the club should be treated



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## NITRO NEWS

should be surrounded by a wooden barrier that's 6 to 8 inches high. (Tires cut in half also make good boundaries.)

Track designs can be as unusual as you want, but everyone in the club should be allowed to make suggestions. Bumps and jumps should be reasonable, and the entire course should be well-groomed, i.e., free of rocks, sticks and other debris. Safety should always be a key consideration.

On-road tracks are usually portable, i.e., they can be folded up at the end of the race day. Many clubs use a simple system of 2x4s bolted together at the ends. You can become increasingly creative with the track's layout as the club grows and the racers become more experienced. To keep spectators at a safe distance, string banners or a rope around the track.

Drivers' stands don't have to be elaborate. In fact, a simple wooden platform or the tailgate of a pickup truck is all you really need.

● **Help the newcomers.** A club can survive and grow only if it builds a foundation for its future. In addition, being one of the best drivers in your club is only exciting if others can challenge you to improve.

Getting excited about R/C racing is easy; becoming successful takes longer. If a newcomer loses interest or has a bad experience, it may be because no one took the time to help. To keep morale up, why not have a "novice day" once in a while? You should also introduce the sport to spectators; promoting the hobby is everyone's responsibility.

● **Join a sanctioning organization.** Whether your club is new or old, joining a national R/C sanctioning body, e.g., ROAR or NORRCA, is advisable! These organizations provide standardized competition rules that are essential for fair racing. More important, they provide comprehensive general liability insurance and accident/medical coverage. Gas racing is significantly more dangerous than electric, so insurance is critical.

In addition, the issues that face R/C racing—FCC lobbying, land acquisition, club assistance, promotional campaigns—are often complicated. Full-time national organizations have the resources



*At the hobby shop, people often spend more time gabbing than they do shopping. Why not make your club one of the hot topics?*

to deal with such issues.

ROAR (Radio Operated Auto Racing) is the largest, oldest sanctioning organization in the U.S. Membership entitles you to participate in many regional, national and even international events (IFMAR). Since its inception, ROAR has been dedicated to promoting and supporting R/C racing.

NORRCA (National Organization for Racing R/C Cars) is another popular organization that holds similar regional and national events for electric 1/10-scale racing.

I don't understand why so many racers spend hundreds—even thousands—of dollars on equipment, but they won't spend \$25 (the cost of a one-year ROAR membership) to preserve the sport.

### ENJOY YOURSELF

Some people race for fun; others, for glory. *Everyone*, however, should participate because they enjoy it. If you become overly emotional when you lose, it may be time to take a break. Losing is part of racing. Even big-time sponsored drivers like Joel Johnson and Cliff Lett lose once in a while (hard to believe), but they maintain sportsmanly attitudes.

Don't take things too seriously. You need a sense of humor and a friendly disposition to make a club work. Even in the largest, most successful organizations, people can disagree and still work together. Good luck! ■

*Jeff Bronstein welcomes your letters! If you have comments, questions, or concerns about gas-powered R/C vehicles that you'd like him to address in this column, please send them to "Nitro News," R/C Car Action, 251 Danbury Rd., Wilton, CT 06897.*





## one mean pussycat!

SCHUMACHER

# Cougar II

by GARTH FINLEY

**W**HAT'S IN a name? When Schumacher\* is mentioned, quality, innovation and world championships should come to mind. Schumacher changed more about its Cougar than the name; there's more here than meets the eye. Comparing the Cougar II/Team Car with the original Schumacher Cougar is like comparing daylight with darkness.

The Schumacher teams—in the U.S.

and overseas—have done their homework. (Unfortunately, the assignment wasn't completed in time for the '91 World Championships!) Schumacher team drivers currently drive the stock Cougar II. Its chassis is far more advanced than those used by Schumacher drivers at the Worlds, and its differential, its friction clutch and its shocks have been redesigned. The results are impressive.

### COMPETITION COMPONENTS

The Cougar II/Team Car rests on 2.2-inch, one-piece wheels and a set of tires that, unlike most tires included with kits, are meant to be used in competition.

The front end is fully adjustable. The hinged front bulkhead allows caster and rake to be positioned between 15 and 30 degrees. A rigid fiberglass shock tower and the lower A-arms are mounted on the





front suspension with ample travel and very smooth damping. As with all Schumacher cars, the dish-shaped front wheels are mounted on axles that are supported by large ball bearings (8x16x5mm) inside the steering blocks. This reduces rotating mass and produces a more rigid wheel-mounting system. The front suspension is complemented with strong turn-buckles and ball cups that allow you to make toe and camber adjustments quickly.



The Cougar II's aluminum-alloy chassis tub is anodized in fire-engine red. Not only does it look impressive, but it's also strong, light and exhibits exceptional torsional stiffness. The

car's molded parts, e.g., its steering and suspension components, are made of Schumacher's Performance Engineered Polymer (PEP). PEP is less brittle, twice as rigid and three times as strong as the plastic used on previous Schumacher cars. The molded suspension parts and the ball-bearing steering rack give precise, slop-free steering response.

Cecil Schumacher and his design team have most clearly displayed their talents on the entire rear section of the Cougar II/Team Car. The new Pro differential is the heart of the highly efficient belt-driven transmission; its hubs are also used as washer carriers. Twelve tungsten-carbide balls are arranged in a massive, 23mm-diameter circle and are sandwiched by a pair of hardened drive washers. When the differential is adjusted to its maximum positive setting, its action is extremely free, and it will provide the rear tires with excellent drive compensation on even the slickest surface.

The ball-raced friction clutch is connected to the upper transmission shaft. It's easy to adjust, and you can change the

connecting spur gear without altering the clutch setting.

The clutch is extremely consistent owing to its hard-anodized aluminum construction and to the polytetra-

fluoroethylene (PTFE) disk that's used between the aluminum plates. PTFE has one of the lowest known coefficients of friction. Glass fibers have been injected into the PTFE disk to



## COUGAR II

Manufacturer ..... Schumacher  
Type ..... 2WD Off-road  
Scale ..... 1/10  
Retail price ..... \$364.95

### DIMENSIONS:

Overall length ..... 14.75 inches  
Width ..... 9.5 inches  
Wheelbase ..... 10.5 inches  
Front track ..... 8.5 inches  
Rear track ..... 8 inches

### WEIGHT:

Gross (with battery) ..... 3 pounds,  
5.14 ounces

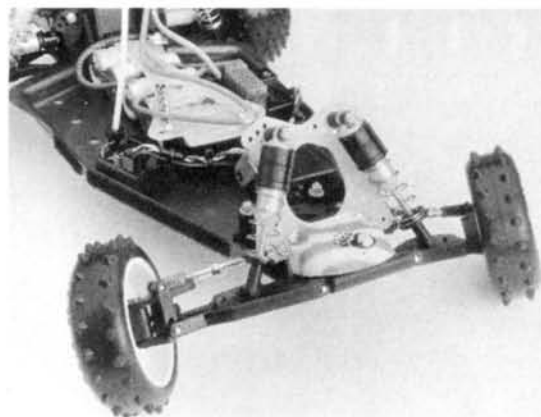


make it stronger.

The new roller drive shafts are the most innovative part of the rear suspension. The aluminum shafts are supported by roller bearings, which smooth the sliding action and eliminate unwanted friction. Now, when the car accelerates in rough terrain, the rear suspension works more freely than it would with the traditional splined shafts.

## CAT ASSEMBLY

● **Transmission**—The transmission assembly is straightforward. The instructions provide excellent support for the diff assembly. When you've assembled the diff, insert it into the transmission housing along with the belt, the upper shaft and the slipper clutch. To set the diff, hold the output shafts and rotate the upper shaft by turning



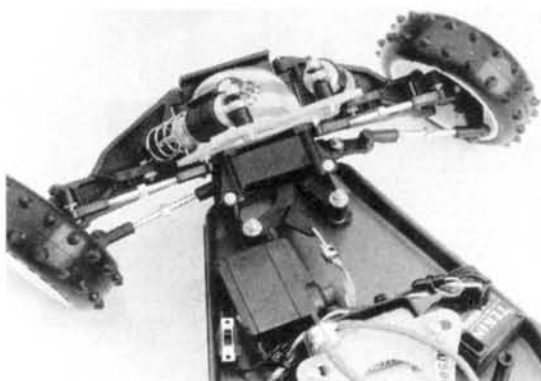
*The Schumacher Cougar II offers many front shock-mounting positions not found on the previous Cougar, so it's easier to find the optimum shock geometry. Its hard-coated shocks have adjustable damping.*

**"The car accelerated quickly from a dead stop and while it exited tight corners. The clutch was consistent from beginning to end, and the Pro diff really helped to balance the car in the slick sections."**

The Cougar II's rear suspension remains essentially the same as the original Cougar's, but the rear bulkhead and the hub carriers are stronger. Medium-length lower A-arms are included in the kit. (Long rear A-arms are available as options, so you can vary the wheelbase.) The A-arms and the shock tower provide many shock-mounting holes for adjustability.

the spur gear with the clutch locked up. Tighten the adjustment screw until it becomes very difficult to slip the diff while turning the spur gear. The diff should feel very tight, and the counter action should rotate freely.

Pay special attention to step 7; be sure that you warm the parts (T030, T1156 and the drive-shaft ends) with hot wa-



*The Cougar II features a fully adjustable front rake, which can be altered by inserting shims between the front shock tower and its mounting bulkhead. To simplify adjustment, light-alloy turnbuckle tie rods are included.*

## BODY:

Type ..... Single-seat buggy  
Material ..... Polycarbonate

## CHASSIS:

Type ..... One-piece tub  
Material ..... Anodized-aluminum alloy

## DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Belt drive (2.43:1 ratio)  
Differential ..... Externally adjustable ball  
Bearings/bushings ..... Ball bearings

## WHEELS:

Front (type): ..... One-piece molded  
dyeable plastic  
Dimensions ..... 2.2x1 inches  
Rear (type): ..... One-piece molded  
Dimensions ..... 2.2x1.375 inches

## TIRES:

Front: ..... Two-row studded (U6523)  
Rear: ..... Twelve-row mini  
pin-spikes (U6518)

## ELECTRICS:

Motor, Battery, Speed Controller ..... Not included

## OPTIONS AS TESTED:

Airtronics\* 94738 servo;  
Tekin TER AM micro receiver and TSC 411G electronic speed controller; Precision Motor Works 14-turn, triple-wind modified motor and 6-cell Panasonic P-170 SCR battery pack.

## COMMENTS:

The Cougar II/Team Car is a serious car that can compete on the highest levels. Every section of the car is well-designed, and it's a big improvement on the original Cougar. Schumacher has combined innovative concepts, trick options, and excellent craftsmanship in the Cougar II.

ter and use the tool provided for the drive-line assembly. Installing the U-joints is a challenge at first, but with practice, you can get the technique down.

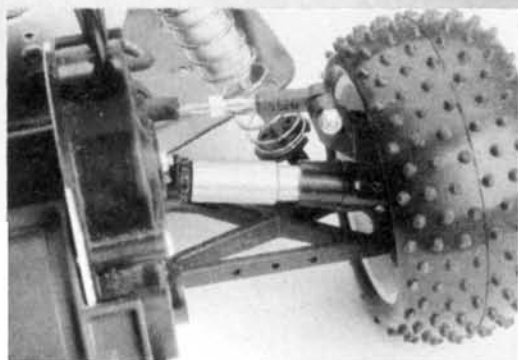
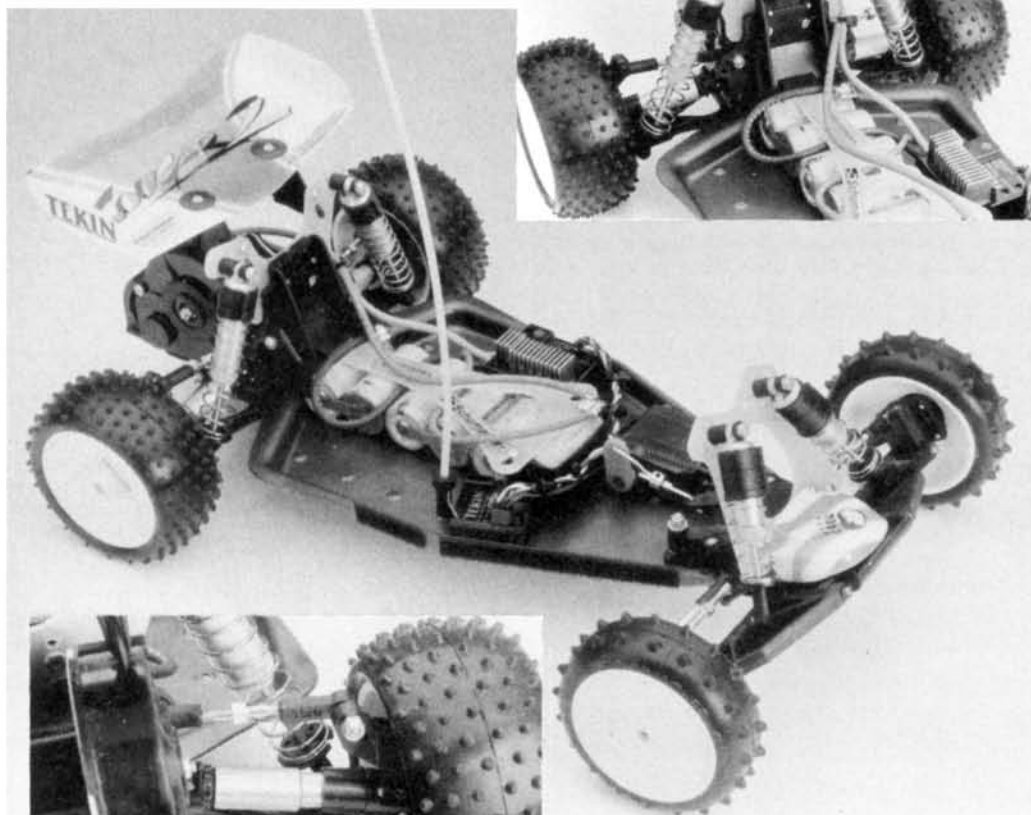
You may have doubts about how to set the belt tension. Step 14 gives a brief description, but I recommend that you set the eccentric bearing housing so that the reference mark is oriented with only one hole between it and the uppermost mounting screw. The picture for step 12 further illustrates where I believe this part should be set.

● **Rear Suspension**—The instructions for the rear suspension are comprehensive. Pay close attention to the pictures; they show you where to mount the upper control link. Use the white nylon washers as spacers for the anti-squat and rear toe settings. Initially, I found that the female drive shafts didn't fit into the bearings that are mounted in the hub carriers. I trimmed the flashing with an X-Acto knife, and now they fit nicely.

● **Front Suspension**—This sec-



Many improvements have been made to the rear of the Cougar II. The bulkhead can now accommodate battery packs made up of cells that are attached at the sides (instead of only stick packs), and a fiberglass brace holds the pack rigidly. A broad choice of shock mounting holes is also provided.



Universal-joint slider shafts tend to create friction and drag. Schumacher's new, aluminum slider shafts eliminate this problem. The inner half of the drive shaft rides on roller bearings that are contained in the outer half, so there's little friction between the two.

tion of the chassis is extremely easy to assemble. My only recommendation is that you buy a Posi-Drive screwdriver with a no. 1 tip. (The screws don't all accept a Phillips screwdriver.) It will help you to mount the bearing retainers and the pan-head screws that fix the front bulkhead's rake angle. The screws will also be easier to install if you apply a small amount of oil to them.

● **Shock Absorbers**—Schumacher has added features that make these shocks appealing. The new piston can be adjusted to control damping. With 10WT oil in the shock, you can adjust the piston to simulate 10WT, 20WT, 30WT, or 40WT

oil. Instead of using a diaphragm seal for volume compensation, Schumacher's new shocks have a foam section at the bottom that allows the shock to behave more consistently and prevents pressurization during stroke displacement. The foam also traps air bubbles, so the oil is less likely to foam. The shocks are hard-anodized, include Teflon-filled pistons, and are very easy to build. They rarely leak, and they provide very consistent damping.

## PRECISION POWER

After I had assembled the mean pussycat, I wanted enough horsepower to break the sound barrier. I chose a Precision

Motor Works\* 14-turn, triple-wind Armageddon Class motor and a set of Precision's 6-cell, Panasonic P170 SCR cells.

## ELECTRONICS

I chose Tekin's\* new TSC-411G speed controller and a Tekin TER AM micro receiver. The 411G has all the features of the 411P and the 420F; it also has new Goldfet transistors that have lower voltage loss than regular FET transistors, and it's the smallest speed controller that Tekin offers.

## DRIVING IMPRESSIONS

It was finally time for the first run. I headed out to my local track with high expectations and

a radical paint job provided by Dude Inc.\* The track's surface was composed mostly of packed clay; it provided plenty of traction. It was adequate for the test because it had rough sections, tight corners, jumps and plenty of places where I could really pull the trigger.

I seated and adjusted the PTFE clutch disk. The first thing I noticed was how silently the belt-driven transmission operated. The car accelerated quickly from a dead stop and while it exited tight corners. The clutch was consistent from beginning to end, and the Pro diff really helped to balance the car in the slick sections.

I set up the chassis using the recommendations provided in the manual. The car turned well into the corners, and it had a slight, controllable push when exiting them. With the track conditions and my driving style, I had to make only a few minor suspension changes. At the end of the day, my final settings were: Associated\* 20WT oil (rear shocks); four holes open; R1.5 springs; no. 3 A-arm hole; middle hole, bottom row of the shock tower; Associated 10WT oil (front shocks); three holes open; F4 springs; no. 1 A-arm hole; center hole in the shock tower; 30-degree rake angle.

## CONCLUSIONS

The Cougar II/Team Car is more than competitive right out of the box. First-time builders can assemble it, yet it will satisfy drivers of any skill level. The car is light, durable and reliable. I think the Cougar II/Team Car will quickly earn respect for its design and its performance.

\*Here are the addresses of the companies mentioned in this article:

Schumacher Inc., 6302 Benjamin Rd., Suite #404, Tampa, FL 33634.

Precision Motor Works, 4950 Waring Rd., #12, San Diego, CA 92120.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

Dude Inc., P.O. Box 31266, Amarillo, TX 79120.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92718.

Airtronics Inc., 11 Autry, Irvine, CA 92718.



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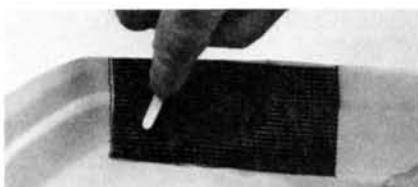
### 3 Easy Steps



Outline Patch Area



Apply a Thin Layer of Adhesive



Apply Super Shock Cloth and Smooth Out  
Let Dry. "Lets Go Racing"

## DIRT-OVAL CHAMPS

(Continued from page 67)

first. Second-place finisher David Wragg of Gainesville, GA, finished a mere 1.5 seconds behind him, while Mike Burke of Warner Robins, GA, took 3rd.

A lot of effort went into making this race a successful national-level event. It was all made possible by the sponsors: *Car Action*, Custom Works, Novak Electronics, Autographics and the Sugar Bowl R/C Speedway. I love the action-filled racing on dirt-oval tracks. If you're currently racing on carpet or asphalt, you don't know what you're missing!

## SCOPING OUT

(Continued from page 64)

servo-mounting tape, so the ESC can be firmly anchored.

With the ESC installed, I added the battery and turned on the transmitter. Only one minor adjustment to the throttle-trim knob on the transmitter was required. The SCI one-pot adjustment, though unusual, seems to be hassle-free.

With the car set up and several battery

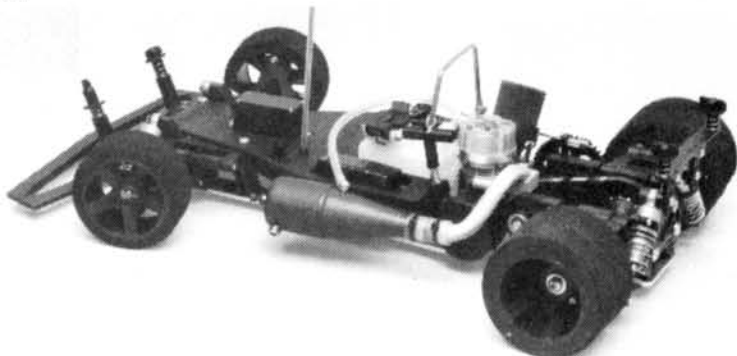
(Continued on page 93)

# Impact 10

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# C&M COBRA

COIL AND STRIKE!

by JEFF BRONSTEIN

**S**UPERSPEEDWAY competition has grown in leaps and bounds, and the racin' recipe for it appeals to those with a taste for raw speed. It starts with a huge expanse of smooth, banked asphalt to which you add nine of your closest door-bangin' buddies and the most important ingredient: a car that runs on the ragged edge of more than 65mph. For extra flavor, drop in a few unique tracks such as King, Lake Whippoorwill and Thunderdrome, and you have a superspeedway smorgasbord!

A superspeedway car should be simple, clean and durable but, most important of all, it should be a winner. C&M Manufacturing\* claims that its Cobra SS will win right out of the box.

## SIMPLY SENSATIONAL

The Cobra SS is strikingly similar to Associated's 10L

SS. Its suspension uses conventional on-road technology with a few racer refinements.

Up front, its black, glass-filled-nylon suspension arms support a floating coil spring and a kingpin. (The process used to color the nylon makes it stronger and more durable.) The rear pod is supported

by two floating ball pivots that are mounted on a T-bar flex plate. A central friction damper handles the pod's torsional damping.

Unlike some half 'n' half road kits, the Cobra SS is a true superspeedway graphite pan chassis with all six of its battery cutouts on the left side. It's also narrow, which reduces drag.

## ASSEMBLY

Like most 1/10-scale pan-type chassis, the Cobra SS is simple and functional. An experienced racer can assemble it in less than an hour, and novices should have few problems. The instructions and diagrams are straightforward and complete, and all the parts come bagged and labeled.





# SPECIFICATIONS

Manufacturer ..... C&M Mfg.  
Type ..... On-road  
Scale ..... 1/10  
Sug. retail price ..... \$254.95

## Dimensions:

Overall length ..... 18.55 inches  
Width ..... 7.75 inches  
Wheelbase ..... 10.75 inches  
Track (f/r) ..... 6.375 inches

## Weight:

Gross (race ready) ..... 43.5 ounces

## Body:

Type ..... Not included

## Chassis:

Type ..... Narrow Pro pan  
Material ..... Graphite

## Drive Train:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Pro-style ball  
Bearings/bushings ..... Ball bearings

## Suspension:

Front: Type ..... Floating kingpin with a spring  
Damping ..... None  
Rear: Type ..... Ball pivot T-bar with a spring  
Damping ..... None

## Wheels:

Front/Rear ..... Not included

## Tires:

Front/Rear ..... Not included

## Electrics:

Motor ..... Not included  
Battery ..... 6-cell straight pack\*  
Speed Controller ..... Not included

## Options as photographed:

Novak NER-3 micro receiver and 410-M1c ESC; Airtronics\* CS-2P radio; Parma\* Dry 24-degree stock motor; Trinity pushed 6-cell pack; Tecnacraft aluminum BBS-style wheels; HPI trued green-dot tires; Trinity "Magic" Pro pinion gear, Pro spur gear and best balls; Associated Team shock and spring; Dahm's Narrow SS Lumina Thunderbody; Bich'n Bodies paint scheme.

## Options as tested:

TRC T/M radials; Bud's bi-level wing; Speedworks tri-rotor Oval Man motor.

## Comments:

After I had adjusted the Cobra's tweak slightly, it performed to my liking. Although the Dahm's Thunderbody scrapes the ground, it really does improve the car's stability. All in all, I was pleased with the performance of the Cobra SS. It may cost a little more than most cars but, with such features as a pro diff and a titanium axle and linkages, it's worth the investment.

\*not included

# COBRA SS

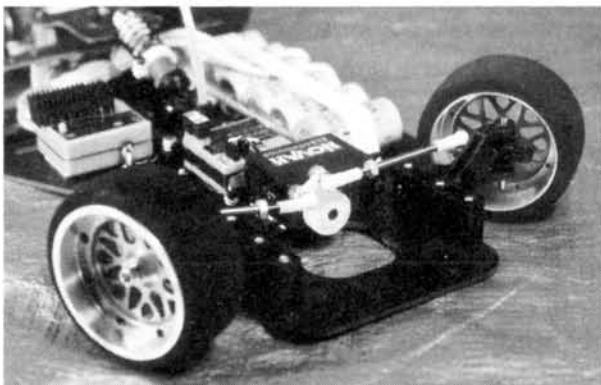
The front suspension arms have 2 degrees of caster built in, and the kit includes titanium turnbuckles and extra shims and springs for track tuning. Three countersunk aluminum screws hold the arms on the chassis. To ensure slop-free travel, the steering blocks and kingpins are secured by E-clips at both ends. The rear end consists of a Velvet Drive five-ball-bearing pro diff, a titanium axle, a precision-machined heat sink and a flex-plate assembly.

Because they move from side to side, make sure that the pivot balls

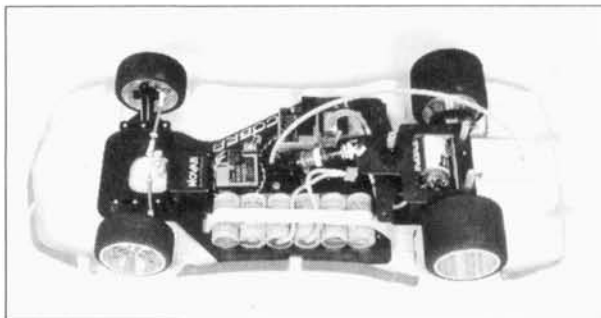
410-M1c ESC and an NER-3 FM 3-channel micro receiver and Trinity\* pushed cells fit the bill. I use a Speedworks\* 13-turn, double-wind, tri-rotor Oval Man motor, because it produces just the right rpm (without much resistance) for super-fast lap times.

For the photos, I used a killer set of Tecnacraft\* gold BBS-style wheels and HPI\* trued green-dot tires. Of course, for the test runs, I switched to TRC\* staggered T/M radials—the only way to go. A Dahm's\* narrow Lumina

Thunderbody tops off (and bottoms up!) the whole package. Scott Bich of (get this) Bich'n Bodies\* gave the car a killer Joe Gibbs Racing/Interstate Batteries paint scheme. (I was so impressed by the finished body that I had to force myself to put the car on the track.) It's obvious that this car is built for one thing—flat-out, blistering speed!



*The black front suspension arms are extremely strong. The kit also comes with titanium tie rods.*



*The Dahm's Thunderbody mounted to the bottom of the chassis improves the car's stability.*

don't bind after you've fastened them in the cups. Although the kit includes a spring for the rear suspension, I replaced it with an Associated\* hard-anodized Team shock, which I mounted on the "tweak" platform. This should greatly improve the car's handling on rough tracks. Aside from this modification, my car is completely box stock. Superspeedway racing requires a lot of equipment, and you should use only the best. (Buy cheap, and you buy twice!) For my car, a Novak\*

used a drop of VRP\* diff lube in the diff, and I tightened it half a turn.

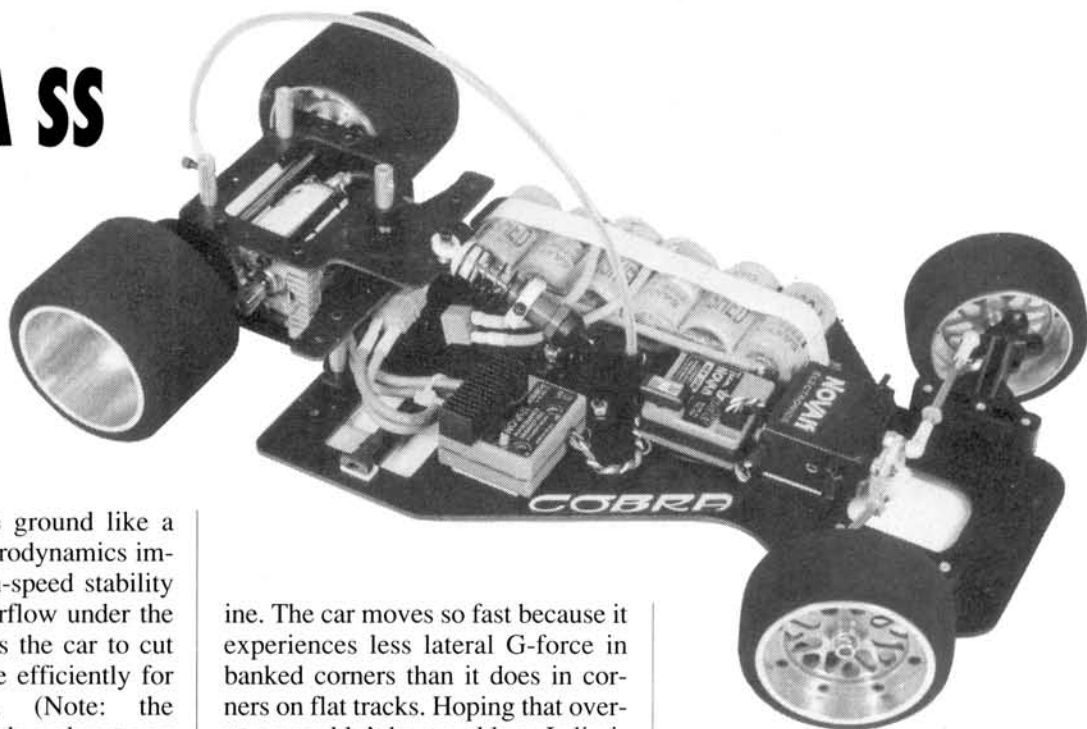
To attach the Thunderbody to the chassis, I wrapped strips of Velcro® around the front and back of the upper and lower sections of the body to hold them together. I had never used a Thunderbody before, and I looked forward to trying it. The principle behind its design is fairly simple. Turbulent air is trapped under its open frame and creates a high-pressure zone that

## FINISHING TOUCHES

I installed all the radio gear, including the steering servo, with strong, double-sided servo tape. I



# COBRA SS



*The Cobra's simple, yet rugged, chassis is made entirely of graphite. The six battery cutouts along its left side mean that this machine is no part-time warrior.*

lifts the car off the ground like a wing. These trick aerodynamics improve the car's high-speed stability by smoothing the airflow under the chassis. This enables the car to cut through the air more efficiently for faster lap times. (Note: the Thunderbody hits the large bumps on the track and makes scratching noises. This is unavoidable)

## PERFORMANCE

Like many of the competitive superspeedway racers, I used a hot modified motor, pushed batteries and capped tires. Because of this, my expectations of the Cobra SS were high. Initially, I ran it on a very large flat-track oval to test its cornering abilities and top-speed performance. The car's steering was responsive enough to negotiate the corners, but its tendency to oversteer reduced its cornering speed. After I had adjusted the tweak slightly, the car pushed initially, but once in the corner, it got back into a tight groove.

The car's outside tires still scrubbed off too much speed, and they wore out quickly. For the second go-around, I moved the Bud's\* bi-level wing back slightly, and I eliminated all the front toe-in. The car ran as if it were on rails, and the added rear downforce reduced tire wear.

The car's speed on long, smooth straights is blistering, and its stability is impressive. (Surprising for a scale 600mph-plus.) When I drove it without the Thunderbody, it was clear that the reduction in drag this part provides really does affect high-speed stability.

Setting up the Cobra for banked ovals is easier than you might imag-

ine. The car moves so fast because it experiences less lateral G-force in banked corners than it does in corners on flat tracks. Hoping that oversteer wouldn't be a problem, I eliminated the tweak and dialed the steering down to its lowest point. During the first laps, I ran the car almost wide open through the corners, but its rear end felt loose. At one point, the car was almost moving sideways. It nailed the wall at about three-quarter throttle, but it wasn't damaged. (Actually, I did this on purpose—yeah, right!).

**The car's speed  
on long, smooth  
straights is blistering,  
and its stability  
is impressive.**

When the tires had heated up, the Cobra's performance was excellent. Several other racers joined me on the track, and I was happy to see that the Cobra SS held its own against formidable competition. If you can't get this car to do well against the big dogs, you had better stay on the porch!

## WRAP UP

The appeal of the Cobra SS is its refinement of traditional, race-proven technology. There aren't any bells or whistles; simplicity is the key to its

success. The people at C&M boast that their company employs racers—not engineers—to build high-performance race cars, and I think they've succeeded.

Although the Cobra SS's price tag seems high and it doesn't include tires, it costs less than many SS kits, and it comes with a pro-style diff and a titanium axle. If you can handle the bill at the hobby store, you won't be disappointed at the track.

*\*Here are the addresses of the companies mentioned in this article:*

**C&M Mfg.**, P.O. Box 701-353, West Valley City, UT 84170.

**Associated Electronics Inc.**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Novak Electronics Inc.**, 128-C E. Dyer Rd., Santa Ana, CA 92707.

**Trinity Products Inc.**, 1901 E. Linden Ave. #8, Linden, NJ 07036.

**Speedworks**; distributed by Trinity.

**Tecnacraft**, 1335B Dayton St., Salinas, CA 93901.

**HPI**, 22600-C Lambert St., Ste. 904, El Toro, CA 92630.

**TRC**, P.O. Box 1058, Albemarle, NC 28001.

**Dahm's Racing**, P.O. Box 360, Cotati, CA 94931.

**Bich'n Bodies**, 4903 Cloverfield Dr., Pearland, TX 77584.

**VRP**, 4555 Groves Rd #15, Columbus, OH 43232.

**Bud's Racing Products**, 1575 Lowell St., Elyria, OH 44035.

**Airtronics Inc.**, 11 Autry, Irvine, CA 92718.

**Parma International Inc.**, 13927 Progress Pky., N. Royalton, OH 44133. ■



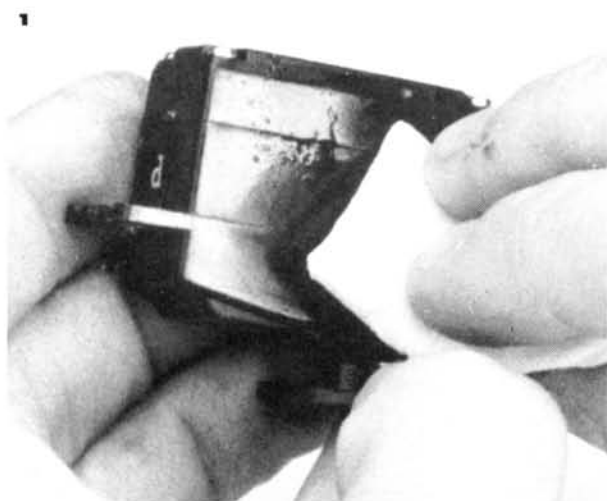
# PART I

## How to install

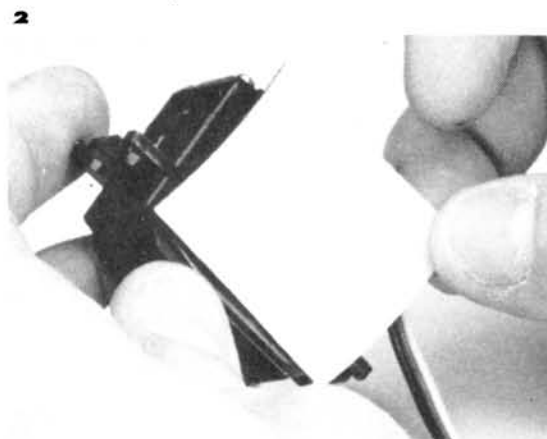
# RADIO GEAR

by FRANK MASI

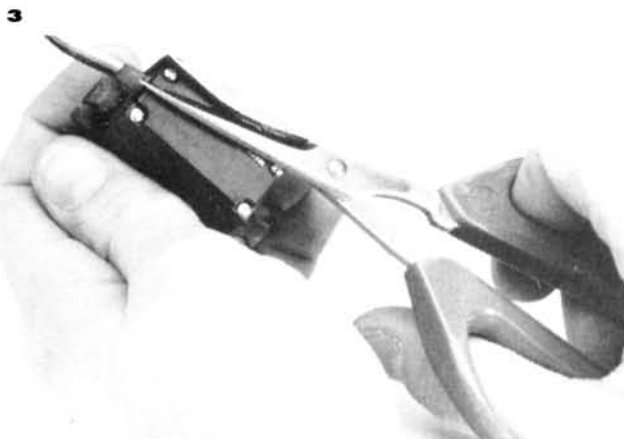
### Steering-servo installation



■ 1. To ensure that the servo tape will adhere well, it's very important that you thoroughly clean the servo and the area of the chassis to which it will be attached. The best way to clean these surfaces is with a rag soaked with motor spray or some other solvent. Just be sure that the solvent you use doesn't harm plastics. Wipe both surfaces thoroughly with the rag to remove adhesive residue, grease and oil. When you use motor spray or any other solvent, try not to get it on your skin. These products can be harmful if they enter your bloodstream.



■ 2. Next, apply the tape to the servo. The servo tape should cover the entire side of the servo. This provides the largest possible area of adhesion, and it prevents dirt and debris from becoming lodged under the servo and weakening the tape's bond. Cut a piece of servo tape that's slightly larger than the servo, and then attach it to the servo. ■ 3. Trim off the excess servo tape with a sharp hobby knife or a small pair of scissors, and set the servo aside.



**I**T'S OFTEN overlooked, but installing your radio gear properly can be just as important as building the car or truck itself.

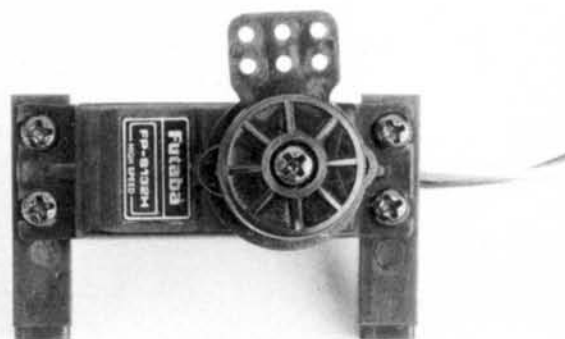
If I had a nickel for every time I've seen a poorly installed steering servo pop off its bed of servo tape, or for each time I've seen a jungle of tangled wires under the body of a car whose young owner doesn't understand why it isn't working correctly, I could hire Cliff Lett to work on my cars himself!

The two common ways to secure the steering servo to the chassis are with double-sided adhesive tape ("servo tape") or with servo mounts (usually supplied by the manufacturer of the car kit). Part I of this three-part series is a step-by-step guide that will show you how to install a steering servo using these methods. Part II will show you how to install and set mechanical and electronic speed controllers. I'll also give you some of the hints and techniques that can help you avoid speed-controller burnout and failure. In Part III, you'll learn which types of capacitor your motor should have and how they should be attached. Also in Part III, you'll also discover the benefits of routing your wires neatly. So read on! The more you know, the more enjoyment you'll get out of R/C.

4

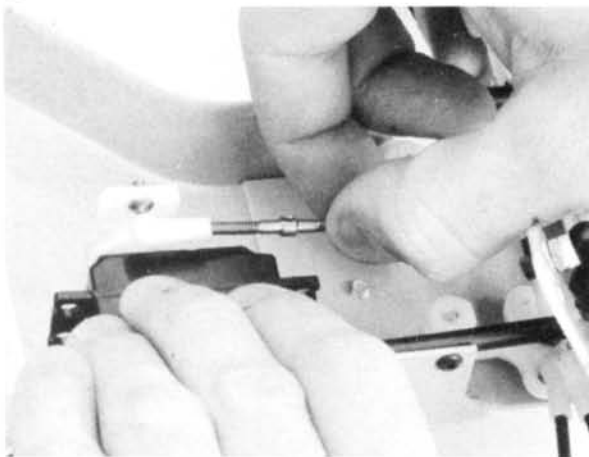


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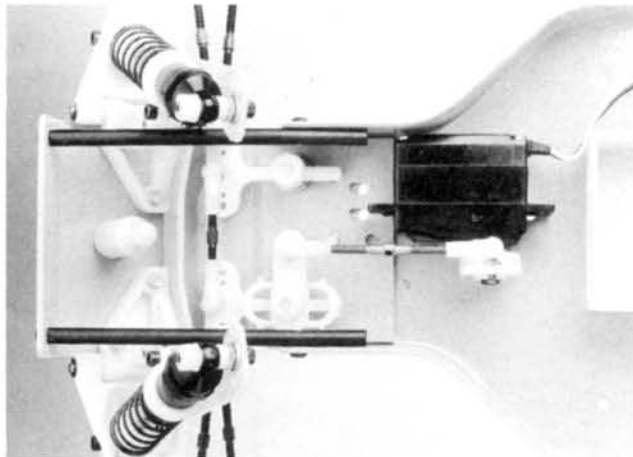


■ 4. If the steering bellcrank on your car incorporates a servo-saver, i.e., a shock-absorbing device that prevents the servo gears from being damaged, you can use a rigid servo arm. If your car doesn't have a servo-saver, buy one that fits the brand of servo you plan to use. (Kimbrough\* makes excellent servo-savers.) Some manufacturers include universal-type servo-savers with their kits. ■ 5. The rigid-mount system: if your kit came with a rigid servo-mounting system, e.g. mounting posts or plates, then all you have to do is attach the mounting posts to the chassis and screw the servo's "ears" to the post. You won't have to determine the correct mounting location because your chassis has probably been pre-drilled.

6



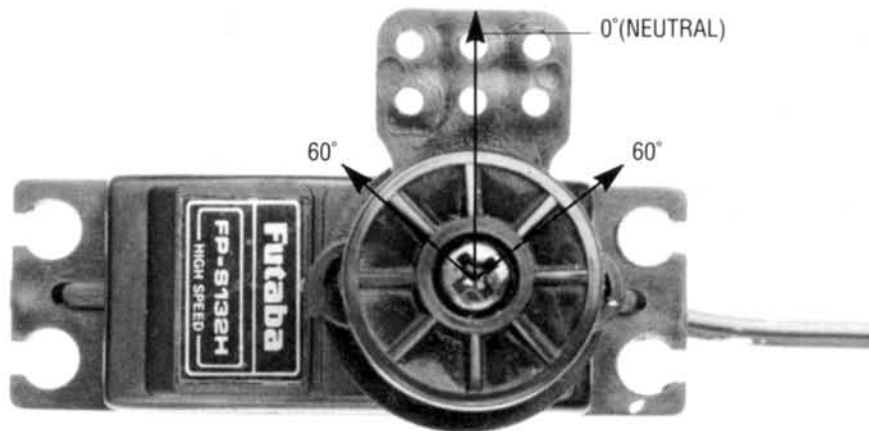
7



■ 6. Now decide where you want to put the steering servo. Set the steering bellcranks so that they're neutral (front tires pointing straight ahead) and determine where you'll attach the servo linkage. Assemble a tie rod that's long enough to reach from the steering bellcrank to where the servo will be placed. ■ 7. Next, attach the steering bellcrank linkage to the servo-saver arm using the tie rod that you made earlier (see photo 6). Most servo arms and servo-savers provide several mounting holes for the tie rod. Use the hole that places the tie rod closest to parallel with the chassis when the servo is neutral, then remove the protective paper from the servo tape and carefully place the servo on the chassis. Try to ensure that: the servo-to-bellcrank tie rod is at a right angle to the bellcrank arm to which it's attached; the servo-saver arm's direction of travel is in line with that tie rod; and the servo is "square" with the car's chassis, i.e., in line with the car's center line. Now, lengthen or shorten the servo-to-bellcrank tie rod so that when the car's wheels point straight ahead, the servo-saver or servo arm is in the servo's neutral position.

8

■ 8. Attach the servo-saver arm to the servo, and center it in the servo's range of travel. There are two ways to accomplish this. First, move the servo-saver arm slowly through its range of travel (usually 60 degrees); note how far it travels in both directions. It should travel the same distance each way. If it doesn't, remove it and reposition it until it does. The other option—probably a simpler one—is to plug the servo into the receiver and turn the radio system on. (Plug in the receiver batteries; if you use BEC or an electronic speed controller, plug in the main battery.) Center the steering servo's trim, then attach the servo-saver arm to the servo so that the arm is vertical when it's mounted in the car. Turn the radio system off, and secure the servo-saver arm to the servo with the provided self-tapping screw.



\*Here's the address of the company mentioned in this article: Kimbrough Products, E. St. Andrews Pl., Unit F, Santa Ana, CA 92705.



## SCOPING OUT

(Continued from page 78)

packs charged, I waited for the kinfolks to arrive. When we had eaten lunch and exchanged presents, we gathered in the yard to play. The Sideways was an instant success. It's equipped with a Slot Machine motor, and I had installed a small pinion gear so that it would plow its way through grass with a vengeance. If you run a car in grass with gearing that's too high, the drag can fry your motor in a single run. Considering my test results, I expected some overheating, but I was pleasantly surprised; after each run, the Power Card was only slightly warm. It seems that when it's mounted on a chassis, much of the heat flows into the chassis. Whatever the reason, the Power Card performed extremely well.

The driving crew included a four-year-old and a five-year-old who got the Sideways stuck many times and don't know what it means to let up on the throttle. The Power Card received a lot of use and

(Continued on page 94)

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## SCOPING OUT

(Continued from page 93)

abuse on that Christmas day, but it never missed a beat.

\*Here's the address of the company featured in this article:

SCI Corp. of America, P.O. Box 13099, Sarasota, FL 34278

## LETTERS

(Continued from page 10)

### HAMMER TIME

I'm a big fan of *Car Action*, and I'm also the proud new owner of a Traxxas Sledgehammer. I'd be very grateful if you could do a track report on it. Does the Traxxas Pro Series transmission fit the Sledge? Tell Chris Chianelli he's my idol. Thanks for the great mag!

JOHN HUDSON  
LaGrange, NC

Well, John, we did a "Track Report" on the Traxxas Sledgehammer in our April '90 issue. No, the Pro Series tranny won't fit the Sledgehammer, but try the Robinson Racing Cluster Gears for the Sledge instead. For more info on modifying your Sledgehammer, check out Lou Marciella's "Hammer Hop-Ups" in the February '92 issue. AS

### HAWAIIAN PUNCH

Thank you for all you've done for the R/C car hobby. Your magazine is very informative, and I've saved a lot of money because of it. *Car Action* has lots of great product-related articles that I love to read. How about doing more driver-oriented articles? I suggest that you do an article (or a series) about driving skills. This is the one thing in the hobby that you can't buy at a hobby store. What's the best way to negotiate a pass? Is there passing etiquette? How about letting another driver pass me? Can I do that without greatly jeopardizing either of our positions?

I'd love to read interviews and drivers' tips from the top dogs in the hobby. You've said repeatedly that their practicing put them where they are today. What exactly do they practice? These top drivers probably take for granted the many skills we novices struggle to learn. If we can learn just a little from them, I'm sure that it would be less frustrating for many of us. I know that many of your readers would

(Continued on page 105)

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TRACK REPORT

OPTIONAL V

TAMIYA

SUPER

ASTUTE

by GERRY YARRISH

### ASTUTE OBSERVATIONS

The Super Astute's chassis is made of black fiberglass. It comes with all the mounting holes drilled and, in some cases, countersunk. The shock towers are made of the same material as the chassis plate, and although they're stiff, they flex a little to absorb shock and prevent breakage. The sturdy A-arms are of black injection molded plastic, and they have a horizontal I-beam cross section that's angled back from the main pivot points by about 3 or 4 degrees. The main pivot point is mounted on the chassis and tied into the front bulkhead. The pivot-pin is secured by E-clips on both ends and it rides in bronze bushings. In fact, all the pivots have bushings and some are damped with small O-rings.

The caster blocks are molded of white nylon, and they have integral steering arms. The Super Astute's rear A-arms are similar to those in the front, but they're stronger. The rear-arm pivot block that's mounted on the chassis also has brass bushings for smooth, precise action. To fine-tune the model's wheelbase, you use the plastic spacers to position the rear hub carriers forward or aft. The rear shock tower is made of the same fiberglass material as the chassis, and it's much stiffer than the front towers.

### A FIRST FOR TAMIYA

The Super Astute is the first Tamiya car to feature a

friction-type slipper clutch. A planetary gear diff is used instead of a ball diff, and the splined drive shaft slips through the main diff and engages the smaller inner gears. The entire main diff gear is mounted in the tranny box. It's protected from the elements, and it's easy to assemble. The drive shafts are free-floating dogbones that are damped at one end with small O-rings (one for each drive).

### DIRT DAMPING

This was my first disappointment: the kit includes plastic shocks. Why include plastic shocks on a car that was designed to compete when the regular Astute is available for those who want a less expensive car? Since this is supposed to be an all-out race car,

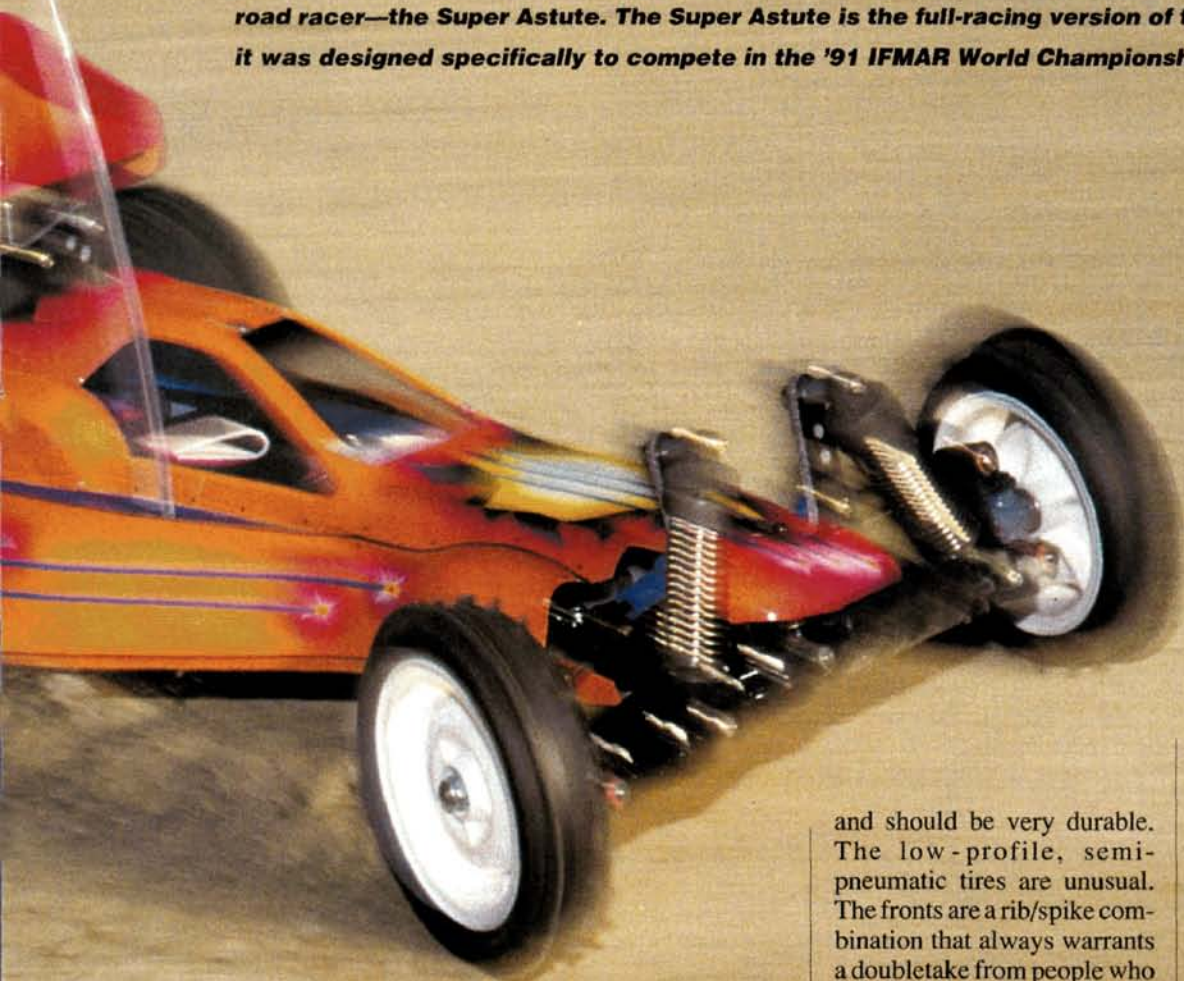




# VERTICAL TAKE OFF!

**NO ONE** who reads *Car Action* needs an introduction to Tamiya\*. This company has been around for a long time and has produced many excellent products, including some of the very first off-road cars. In its earliest days, U.S. R/C off-road racing was dominated by Tamiya cars, but this seemed to change when Cox released the *Scorpion* and Associated introduced the *RC10*. Tamiya's design philosophy seemed to be at odds with what American companies produced—and what American racers wanted.

Because Tamiya takes the U.S. market very seriously, it has set out to recapture the off-road market—a long, arduous journey. One of Tamiya's weapons in this battle is its newest 2WD off-road racer—the *Super Astute*. The *Super Astute* is the full-racing version of the *Astute* car, and it was designed specifically to compete in the '91 IFMAR World Championships.



aluminum shocks would be a logical upgrade. The plastic shocks work fairly well, but they may not be very durable. Both the front and the rear shocks are secured to the towers by aluminum standoffs—a very solid connection.

## WORLDS WHEELS

The *Super Astute*'s 2.2-inch, one-piece rims and rubber tires were designed for the soft surface of the SEMROCC track in Detroit, MI, where the Worlds were held. The 5-spoke slotted rim looks very sturdy

and should be very durable. The low-profile, semi-pneumatic tires are unusual. The fronts are a rib/spike combination that always warrants a doubletake from people who see them for the first time. The rear tires have 10 rows of spikes. The instructions tell you to glue the tires to the rims to minimize slippage.

## ADDITIONAL FEATURES

Although you can easily fine-tune and adjust this car's camber and toe in/out, you do so using the ball-link attachment

points. This was my second disappointment. For world-class competition, the *Super Astute* should logically have turnbuckles to facilitate trackside adjustments. If you're competitive, you'll want to upgrade here.

## ASTUTE BODY WORK

The body is a clear vacuum-formed polycarbonate affair with an upper shell and a lower belly-pan cover that's screwed into place. The upper and lower body halves are joined with Velcro® strips, and this setup does a good job of keeping crud out of the electronics.

The wonderful orange and

(Continued on page 103)



## SUPER ASTUTE

**Manufacturer** ..... Tamiya  
**Type** ..... 2WD off-road  
**Scale** ..... 1/10  
**Price** ..... \$250

### DIMENSIONS:

**Overall Length** ..... 14.75 inches  
**Width** ..... 9.75 inches  
**Wheelbase** ..... 10.625 inches  
**Front Track** ..... 8.75 inches  
**Rear Track** ..... 8.25 inches

### WEIGHT:

**Gross (with battery)** .. 3 pounds,  
 7 ounces

### BODY:

**Type** ..... Buggy  
**Material** ..... Polycarbonate

### CHASSIS:

**Type** ..... Pan  
**Material** ..... Fiberglass

### DRIVE TRAIN:

**Primary** ..... Pinion/spur  
**Transmission** ..... Gear  
**Differential** ..... Gear  
**Bearings/Bushings** .. Ball-bearing  
 tranny Twin, Oilite, front-wheel  
 bushings

### SUSPENSION:

**Type (f/r)** .... Single A-arm/upper  
 camber rod  
**Damping (f/r)** .. Plastic, oil-filled,  
 coil-over shocks

### WHEELS:

**Front: Type** .. One-piece, 5-spoke  
**Dimensions (DxW)**  
 2.2x.75 inches  
**Rear: Type** .. One-piece, 5-spoke  
**Dimensions (DxW)**  
 2.2x1.5 inches

### TIRES:

**Front** ..... Rib/spikes  
**Rear** ..... 10-row spikes

### ELECTRICS:

**Motor** ..... 540\*  
**Battery** ..... 6-cell stick pack\*  
**Speed Controller** ... Not included

### OPTIONS AS TESTED:

Novak 410-M5 ESC and NER-3FM receiver; Futaba FF3 3UCP radio and 9301 servo; 34-degree stock HPI Uno motor.

### COMMENTS:

Tamiya takes a step forward with this car. The revised tranny has a slipper clutch (a first for Tamiya), but it has a gear diff, not a ball diff. The only major complaints I have concern the lack of turnbuckles and the front suspension shocks, which lack travel. With a little work, the Super Astute can become a top contender.

\* not included



(Continued from page 99)

blue paint job with custom "ripped-through" graphics is the handiwork of Richard Muise of Motion Graphics\*. Do yourself a favor and drop the coin for one of Rich's paint jobs. He does some wonderful things!

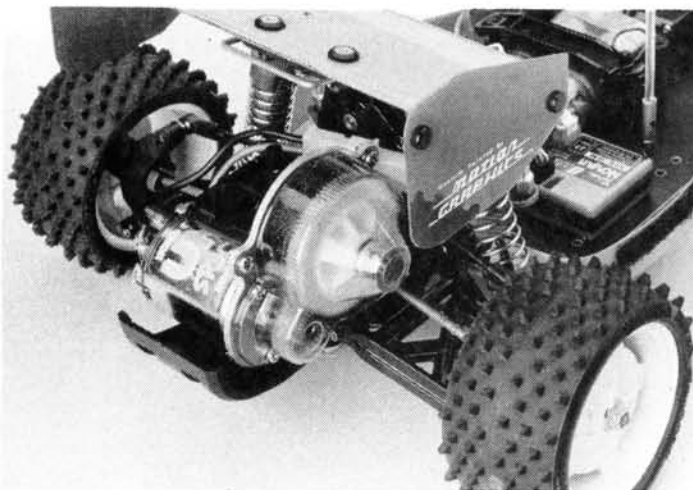
### RUNNING GEAR

My model is guided by a Futaba\* 3UCP PCM micro-processor-controlled radio with an S-9301 steering servo. This state-of-the-art transmitter makes it very easy to set up and fine-tune the car for any track. I used the Team Novak\* NER-3FM receiver because it was a perfect match for the Novak 410-M5 speed controller I installed. This controller works very well and doesn't

glitch at all. With a Sanyo 1400mAh SCR 6-cell pack, it delivers about 10 minutes of non-stop, sand-blasting action. I'm very happy with this combination and consider it my standard setup. The motor (not included in the kit) is a stock HPI\* UNO. It works very well, and it has twin noise-suppression caps installed—nice touch!

### PERFORMANCE

With the batteries fully charged and my transmitter settings perfect, I loaded my gear and headed to a local off-road track to put in some laps. It had been a long time since I'd driven a car using a stick radio but, like riding a bicycle, there are some things you never forget. After the first few laps, I noticed that the Super Astute tended to oversteer when exiting corners. I attributed this to the planetary gear diff and concluded that proper slipper adjustment is critical to this car's performance. I pulled into the pits for some a little slipper "wrenching." I made a series of full-throttle takeoffs from a dead stop, and set the slipper so that it slipped for about 18 inches. Back on the track, the car was much more stable out of the turns and, owing to the minimal friction with which the gear diff operates, it carried its speed well through the corners.



*The Super Astute comes with a slipper clutch as standard equipment—a first for a Tamiya car! As in the front, the rear A-arms are supported by small, bronze bushings.*

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### PRO-82



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**DESIGN:** Ultra Mini-Pin Fits 2.150" PRO-LINE\* or 2.2 Rear Wheel.

### PRO-101

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\*Fits PRO-LINE 2577 (RC10) or 2578 (LOSI)

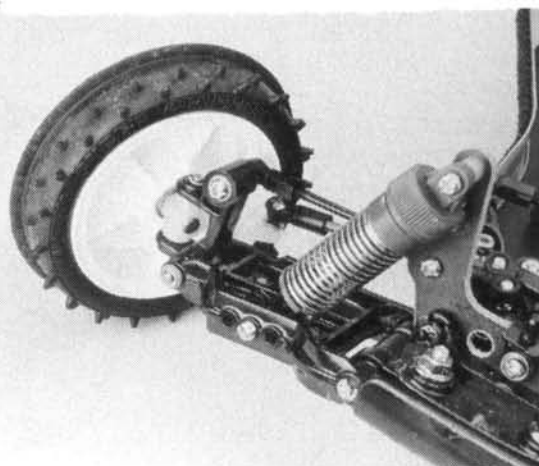
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# SUPER ASTUTE



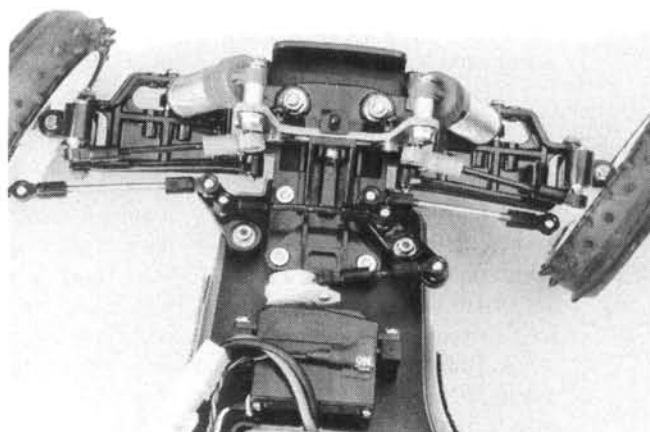
Shortcomings? The front shocks. Although I'm not a fan of plastic shocks, the rear shocks performed adequately, but the fronts just weren't up to the task. They were too short to give the Super Astute the travel it needed (and was designed to have), and

*The Super Astute is the only off-road car in which tiny bronze bushings are used to support the suspension arm hinge pins. The suspension operates smoothly and precisely. The Super Astute also has in-line steering blocks that reduce wheel scrub.*

with the rest of the car.

The Super Astute is a well-designed and well-built car, and it shows that

Tamiya is making sincere efforts to be competitive in the 2WD off-road racing market. The Super Astute incorporates many state-of-the-art features. With the exception of the shock absorbers and the ball-link suspension adjustments, the model goes where no Tamiya model has gone before. With minimal upgrading, the Super Astute will certainly land you in the winners' circle.



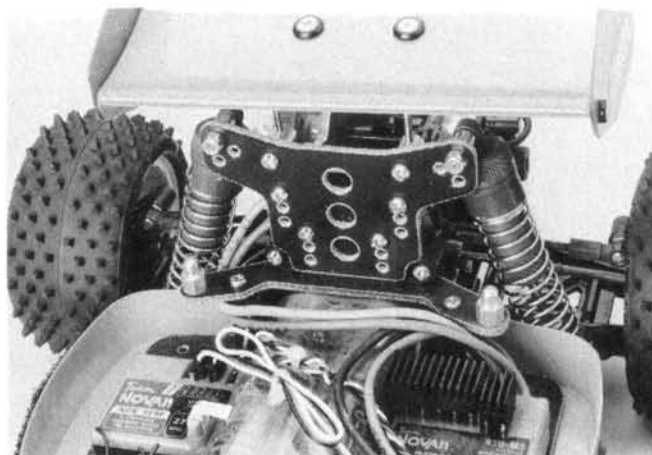
*An excellent set of bushing-supported bellcranks handles the steering. The steering servo is attached to the chassis securely by two molded hold-down posts. On a car of this caliber, the lack of a turnbuckle suspension linkage is unfortunate.*

the springs were much too soft, which caused the car's nose to drop over jumps and bumps. The shocks are just out of line

*\*Here are the addresses of the companies mentioned in this article:*  
**MRC/Tamiya**, 200 Carter Dr., Edison, NJ 08817.  
**Motion Graphics**, 2645 Robert Arthur Rd., Westminster, MD 21158.

**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.  
**Novak Electronics Inc.**, 128-C E. Dyer Rd., Santa Ana, CA 92707.

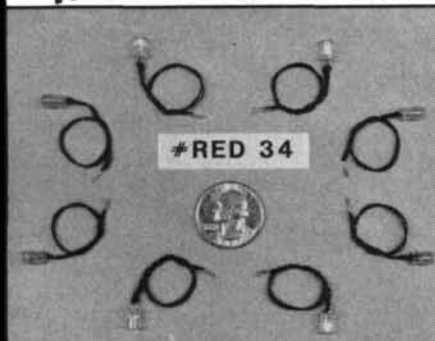
**HPI**, 22600-C Lambert St., Ste. 904, El Toro, CA 92630. ■



*One of the Super Astute's several innovative features is its adjustable rear shock tower. Three sets of mounting holes enable you to alter the tower's height. The inclusion of plastic shocks instead of metal ones, however, was a disappointment.*



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## LETTERS

(Continued from page 94)

greatly appreciate any kind of "Drivers' School" article.

ROMEO S. COLLADO  
Mililani, HI

We receive many letters requesting more articles about driving skills. In the upcoming '92 Radio Control Action Series Off-Road special, there's an article called "How to Drive Like the Pros." In it, Cliff Lett, Joel Johnson and Jumpin' Jack Johnson give pointers about passing, getting good starts and driving lines, among other things. In the meantime, it seems that you've given your driving a lot of thought, and that's half the battle. You'd be surprised at how little planning many of your competitors do. Remember, R/C racing is a strategy game; strategy requires thought and planning to execute. The racer who thinks about what he and his car are doing will be the winner every time. FM

## MAGMA CUM LAUDE

I need your help! I'm 14 years old, and I want to become a R/C racer. I own a Nikko Magma that my mom bought me four years ago. The car runs fine. There's nothing wrong with it, except that it's too slow. Do you think I should try to make it go faster, or should I buy a new car? If you think I should make it go faster, what changes do you suggest? If you suggest I get a new car, what do you recommend for a beginner? I know that you don't usually answer questions about this kind of car, but I'd appreciate your help.

JERRY BLAZER  
Fairborn, OH

(Continued on page 108)

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## LETTERS

(Continued from page 105)

The Nikko Magma is a fine car if you want to get into the hobby with the least amount of pain, but if you're after more speed, you'll need to buy a new car. For off-road racing or running, I highly recommend Team Losi's Junior Two and Kyosho's new Raider Pro. The Junior Two is aimed at entry-level racers; the Raider Pro (and the pre-assembled Raider Pro ARR) are more suited to the "backyard" enthusiast.

AS

## GOOF OF THE MONTH

Once in a while, a racer will do something so dumb that it will be worthy of the "Goof Of The Month" award. We have some great racers here, so it's hard to find someone each month to give this award to, but this time we have a real "dilly" to tell you about.

The racer involved is by no means a newcomer. He has been around long enough to know better, but that didn't stop him from making a complete fool of himself. You have to understand that he wasn't quite himself that night. He had a terrible

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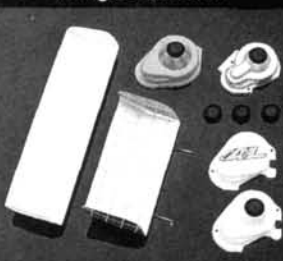
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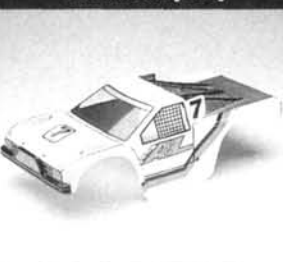
▼Lazer Body (Tub Optional)



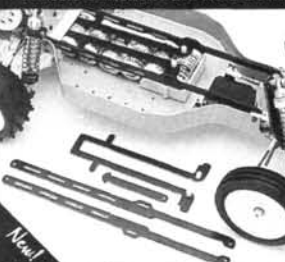
▼Bearings & Shims



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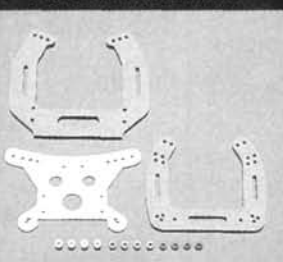
▼Lethal Weapon II



▼Aluminum Lazer Parts



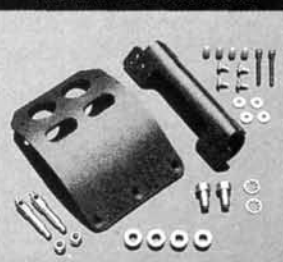
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cold and had taken some cold medication before the race, which has prompted us to insert a new rule about driving under the influence.

It was 1/12-scale night, and the racer was ready to race. He missed the A-Main, but that was OK because he and his son were both in the B-Main, and it's always fun for any dad to race his 11-year-old. After all, he can just play with him for a while before he puts him away in the last minute of the race...right? Not this night. You see, both cars in this father/son racing team are the same color. The most noticeable difference is the numbers on the noses: dad's car is number 5; the son's is number 1.

The race was about to begin, so the drivers took their positions on the drivers' stand and readied themselves for four minutes of heavy concentration. The signal came, and the cars were off! It was a good start; the racer just missed a crash in turn one and took the lead. The car was running great and hugging the track around each turn. He had half a lap lead coming out of turn four on this 60-foot oval. "Ease it into turn one," he thought. His son seemed to be having some trouble in turn two. He got by, and was as smooth as could be. Going into turn three, he heard the banging on the wall and noticed, out of the corner of his eye, that his son had lost all control and the car seemed to be going crazy. If it wasn't working, why didn't he pick it up? There's no sense in totaling a good car in the second lap of the B-Main. Besides, he thought his son had more respect than that! The racer was just about to say something as he exited turn four.

Suddenly, a cold sweat came over the racer, and he thought, "How will I ever live this one down?" He dropped his radio to his side and hung his head. He couldn't help laughing *himself*, so how would the other racers react? What did he see coming out of turn four that turned his great race into a nightmare? The number 1. That's right, it was *his* car that went crazy in turn two! From the start, he had his eyes on the wrong car and thought he was doing a wonderful job driving it!

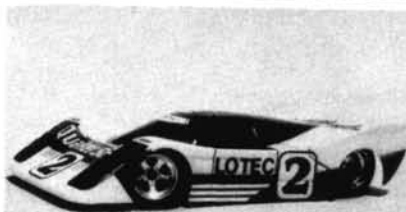
I've agreed not to use any names in this letter because it would be too embarrassing for the racer. But I will tell you this: I will *never* paint our cars the same color again!

ROGER DELOACH  
Duluth, MN

(Continued on page 114)

*Andy's*

## R/C PRODUCTS BEST FROM THE WEST



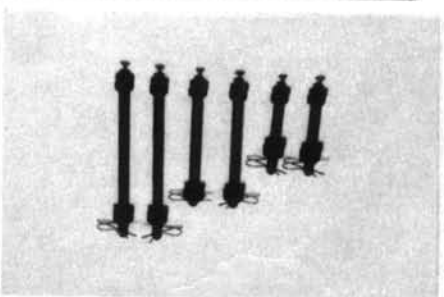
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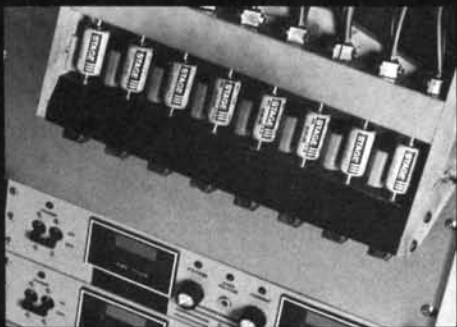
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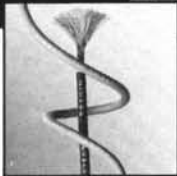
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## LETTERS

(Continued from page 109)

Hey, now this sounds like the start of something good. We've all had or witnessed major "goofs." If any of you have interesting stories, we'd like to hear them.

JH

## PSYCHIC READER

Your detailed comparisons of two competitive cars is my favorite part of the magazine. I'd really like to see a comparison of the Traxxas TRX-1 and the Schumacher Cougar II—equipped with the same type of motor, ESC, batteries and radio gear to keep the comparison as fair and unbiased as possible. I'd also like to see you compare the Traxxas Blue Eagle and the Schumacher Shotgun on an off-road track. In my opinion, running different equipment in two cars that you're comparing seems biased, and it usually gives one car an advantage.

SHAWN WALDROP  
Plano, TX

Have you ever thought of becoming a fortune teller? You came pretty close to

(Continued on page 119)

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## LETTERS

(Continued from page 114)

predicting one of our upcoming feature articles: an all-encompassing 2WD shootout, featuring the RC10 Team Car, the JRX-Pro SE, the Traxxas TRX-1, the Schumacher Cougar II and the Kyosho Triumph. Rest assured, Shawn, all the equipment in the cars will be equal, and we'll drive the cars, not just compare features. Look for it in our upcoming Off-Road special!

AS

### BLAST FROM THE PAST

I'm appalled at racers' comments about older cars. At my local track, one person raced a Tamiya Fox. People laughed, but he won first place in the stock class A-Main. I own a Turbo Ultima, and I consider it a good car. My Ultima can outrun most of the cars I race against. I'm not the best driver in the world, but I have fun trying. Just because new cars come out doesn't mean everyone should go out and buy one. What fun would the sport be if everyone drove the same car? It would get

(Continued on page 122)

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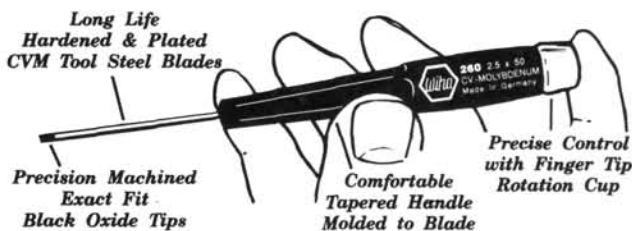
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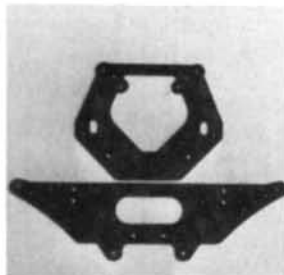
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## LETTERS

(Continued from page 119)

boring. I wish people would race a wider variety of cars. Cars should collect mud on the track, not dust on the shelf! I'm not putting down newer cars. I own a Junior T, and I like racing it, too. So, to all the newcomers, I have three things to say: buy what you can afford, don't worry about what other people think and have fun. Awesome magazine!

BRUCE ARMES  
Joliet, IL

*What an astute observation about the hobby, Bruce. True words of wisdom. Are you guys listening? I bet that many of you have cars that just sit on your shelves at home. Why not dust 'em off and run 'em? Better yet, give them to young people and help them get started in R/C. You know, it might be time to pull out my old Yokomo Dog Fighters (the original chain-driven ones) to give the local Lazors some competition!*

FM

## NEITHER A BORROWER NOR A LENDER BE...!

I'm borrowing my friend's Pro-Tech AC/DC 702 battery charger. It worked great until my friend bought a used battery pack. I plugged the battery pack into the charger to charge it, and the meter jumped past 5 amps in the positive side. The meter needle was as far as it could go. I unplugged the pack quickly and told my friend that the battery was bad, but he said to charge it anyway, so I did. The connectors got really hot, but they didn't melt (I'm using Dean's connectors). The amps went to zero after two minutes. The charger will discharge, but it won't charge any of my battery packs. I replaced the fuse, and still nothing happens. I haven't told my friend about this yet! Help!

CHRIS JAMES

*The writer from nowhere*

*We won't tell your friend, but you'd better keep this issue from him. To tell you the truth, if he told you to "charge it anyway," it's his problem! The cause was probably the used battery pack. Give Pro-Tech a call at (213) 384-0887, and see what the repair will cost your friend. I'm sure they can help you out.*

JH

## PAINT PROBLEM

In the past year, my sons and I have bought three R/C Traxxas Hawk trucks.

(Continued on page 127)

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**T**HANKSGIVING: the holiday has strong roots in American history because of a determined group—we call them the “Pilgrims”—who set out on an incredibly grueling journey over the treacherous waters of the Atlantic and carved out a new life for themselves after bumping into Plymouth Rock. We think about them each November as we turn our attention to turkey, dressing, cranberries, football games, sweet potatoes and comm-truing sticks.

*Comm-truing sticks?*

You bet! This story is about Thanksgiving Weekend in Independence, OH, where 330 pilgrims of a different kind from all over North America and Europe journeyed to a

mecca known as the Cleveland U.S. Indoor 4-Cell 1/12-Scale Championships (CIC).

### A DIFFERENT KIND OF PILGRIM

For European champion Oscar Jansen, travelling with Constant Paul—

1991 Dutch champ and owner of Corally—this was more than just a 5,000-mile journey from Dordrecht, the Netherlands. This was a chance to test their mettle against some of the world's best.

*(Continued on page 128)*



The Cleveland race has been held 11 times, and Joel “Magic” Johnson has won five times!

**MAGIC  
IN THE  
MIDWEST**

PHOTOS BY MIKE HICKS

# CLEVELAND INDOOR CHAMPS

by MIKE HICKS



Here's the problem! Dosek's missing wheel dot eventually cost him 3rd place.

## LETTERS

(Continued from page 122)

We find this hobby very enjoyable and find *Radio Control Car Action* very informative.

My main query is about an article on Lexan body painting that I read in your September '91 issue. I've learned a lot about the technique, and I've used it on all three trucks. My problem with this paint is, a few days after I apply it, it starts to peel off. It's very disappointing to see many hours of work destroyed in a few days.

MIKE EVANS  
St. Joe, IN

*You could be having this problem because you're not using the right paint or because you're not washing the body properly before you paint. The best way to go about painting a body is to wash it in warm, soapy water to remove any oils or traces from the mold release. Mask off the windows and any stripes or designs with 3M, or similar high-quality making tape. The paint you use should be marked for use on Lexan. Pactra has a large selection*

(Continued on page 130)

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# CLEVELAND INDOOR CHAMPS

**"Getting the very best out of these 1 3/4-pound carpet demons requires cleanliness, experimentation and a lot of thought."**

(Continued from page 125)

"Here in America, although Corally is known, we are not known. In some ways, that's great because you can concentrate on your driving and setting up your car. But having to think hard about every word you say because it's in another language is tricky, especially when you're talking about technical matters," explained Jansen.

For fledgling body designer/manufacturer David Berger (Fast Fashion Bodies) and three racing

friends—packed into one hotel room and pinching every penny twice—this 2,500-mile pilgrimage from California was a lot of fun. Surrounded by other racers, toolboxes, a charger, batteries,

underwear and lunacy, David explained:

"Our Nissan GTP body was approved by ROAR last year, and we wanted to show it off at this event. We've been blown away by the quality of the racing and by the quality of the people. Unfortunately,

we're not getting any sleep—or any good lap times!"

For 80-year-old Alex Gombachm, this pilgrimage followed 32 years of devotion to R/C racing that started with the very first Heathkit cars of the late '50s.

And for three generations of the Zufelt family—Jim (78), son Fred (40) and grandson Mikey (12)—after a brutal 20-hour drive from Ottawa, Canada, this was a real adventure. Experienced 1/8-scale gas mechanic and accomplished rubber-band-powered-aircraft flier grandfather Jim Zufelt would later proudly see his grandson drive his way to 1st place in the R-Main. "Competitive rubber-band planes will fly from 15 to 20 minutes on a single wind if you set them up right," he said, "but this!—this is really something!"

## MORE THAN JUST RACING

Now an 11-year-old tradition, the CIC is also the first leg of the 4-cell Triple Crown. (Other races in the series take place in Grand Rapids, MI, and in Detroit.) The Cleveland race is an extraordinary event. It's also a showcase for everything from cars to dynos

to tires and hop-up parts of every description.

As you wander the hallways of the five-story hotel, you see that virtually every room is occupied by at least one racer—often by three or four. The entire hotel smells of tire compound and motor spray, and the sound of motors being broken-in and tires being trued is present virtually 24 hours a day for five days straight!

For many who make the pilgrimage, it's an opportunity to do some pretty extraordinary things: to stop Bob Novak or Tekin's Kevin Orton in the lobby and tell them how much you enjoy using their products; to ask one of the champs how you might set up your diff just a little better; to watch Mike Blackstock and Mike Ebert go head-to-head on a video driving game outside the ballroom while qualifiers are being run inside; to wander around with a magic marker in one hand and an unpainted car body in the other and collect autographs from just about anyone who has ever been one of your heroes.

If, in a normal day's racing, you have four or five hours to kill between qualifiers, you might go crazy, but at the U.S. Indoor Champs, there's never quite enough time to get everything together.



**Above:** those using Panasonic's new cells had very good luck at this race. They ran for the full 8 minutes, and were the choice of many racers. This is a major victory for Panasonic.



**Right:** TRC's new ZR-1 tires were very popular at the Cleveland Champs. They're extremely light, yet very rigid.

## THE WINNERS

### Modified A-Main

Fin	Qual	Name	Chassis	Motor	ESC	Radio	Batteries
1	1	Joel Johnson	Composite Craft 12LW	Trinity	Novak M5	Airtronics Caliber	Trinity Pushed Panasonic
2	2	Mike Ebert	Associated 12LW	Reedy Mr. E	Novak M1c	Airtronics Caliber	Team Arlington Panasonic
3	6	Frank Calandra	Corally 12G	Trinity	Corally	KO Propo	Trinity Pushed
4	3	Andy Dobson	Composite Craft 12L	Trinity	Novak M5	Futaba	Trinity Pushed Panasonic
5	9	Dwight Smith	Associated 12LW	Reedy Mr. A	Novak M5	KO Propo	Advantage
6	10	Chuck Lonergan	Associated 12LW	East Coast	Novak M1c	KO Propo	PTI/Advantage
7	8	Mike Blackstock	Associated 12LW	Reedy	Novak M1c	KO Propo	Power Push
8	4	Terry Rott	Associated 12LW	East Coast	Novak M1c	Airtronics Caliber	Advantage/East Coast/PTI
9	7	Bob Schoenau	Corally 12G	Twister	Tekin 411G	KO Propo	Team Arlington
10	5	Chris Doseck	Associated 12LW	CAM	Novak M5	KO Propo	Team Arlington

## WALKABOUT WISDOM

Perhaps the most extraordinary thing about this event—other than how NORCAR manages to run it just a little more efficiently every year—is what you can learn by talking to people. Getting the very best out of these 1<sup>3</sup>/<sub>4</sub>-pound carpet demons requires cleanliness, experimentation and a lot of thought.

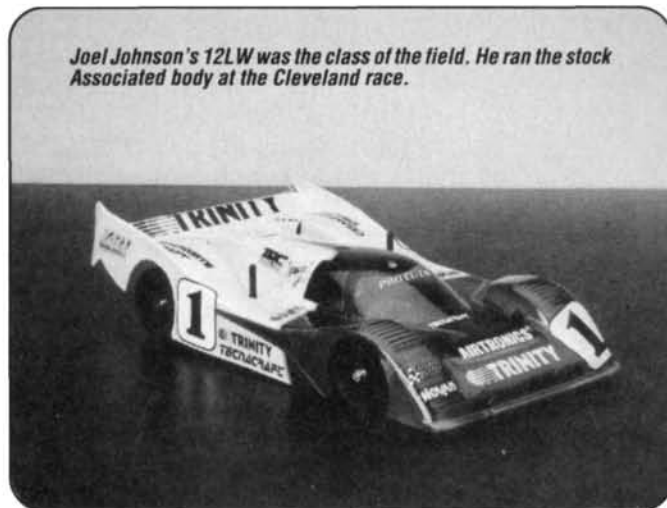
At the CIC, everyone, from battery-matching specialists like Gary Okicki (Perfect Match) and Tony Carruba (Power Push) to the guy two doors down the hallway from your room, has his own theory about what works and what doesn't as far as charging, discharging and matching packs are concerned. In '91, batteries were definitely the most popular topic of conversation.

But what makes the event unique is that any racer can approach Tim Morton and ask him about TRC products, or sit down with Kent Clausen and ask for help on how to make your Lavco gear perform, or approach an A-Main racer like Joel Johnson or Chris Doseck and get a superstar's

evaluation of your car or hints on driving technique. The racers and the manufacturers are there for many reasons, but none ever loses sight of the

type is this year's stock hobby shop item, and there were hundreds of the production version on the track.

The '91 event also gave



Joel Johnson's 12LW was the class of the field. He ran the stock Associated body at the Cleveland race.

importance of the average racer.

For manufacturers, nothing beats track time at a real event for testing a product to its limits. In 1990, most of Team Associated ran what's now the 12LW, and Mike Reedy and his people were constantly evaluating its performance. Last year's Associated proto-

Corally a chance to see how its new 12G would do, and with its new front suspension, the car seems destined to be a hit. Not only is it more forgiving over rough ground and bumps, but it may also be the easiest and most flexible Corally of all to set up.

The advent of

Panasonic's 1700 SCR battery has thrown traditional logic and charging rituals out the window, because these batteries seem to be tougher than the thin-wall, Sanyo SCEs. Remember, these are 8-minute races, so squeezing every available electron out of four cells is crucial to fast times.

## RUNNING SMOOTHLY

Twenty-one Stock Sportsman racers and 120 Modified drivers began to register on Wednesday night and continued throughout Thursday. By then, many racers were already taking advantage of the practice schedule.

Racers each ran four qualifiers (two on Friday and two on Saturday), and the Mains were scheduled for Sunday. Tech-in was staffed well by volunteers from the Northern

(Continued on page 154)

**"The advent of Panasonic's 1700 SCR battery has thrown traditional logic and charging rituals out the window..."**

## Stock A-Main

Fin	Qual	Name	Chassis	Motor	ESC	Radio	Batteries	Body	Tires
1	1	Willy Decker	Corally 12G		Tekin 411G	KO Propo	Bullet	Andy's Lotec	Corally
2	3	Jim Piersol	Delta Super Spyder	H	Tekin 411G	Airtronics	A&D Select Cells	Bud's Nissan	Delta Green
3	2	Mike Marshall	Woods Exterminator	P	A	Novak M1c	Futaba	Bud's Nissan	Du-Mor
4	6	Aaron Buran	Associated 12LW	A	N	Novak M5	Futaba	Bud's Nissan	Paragon/DuMor
5	9	David Heath	Woods Exterminator	R	D	Tekin 411G	KO Propo	Duke's Competition Matched	Bud's Nissan
6	5	Jim Arnold	Corally 12G	M	Tekin 411G	KO Propo	Team Arlington Panasonic	Bolink Porsche	PK Silver/PK Gold
7	10	Greg Klugh	Associated 12L	A	O	Novak M1c	Airtronics	Bullet Matches SCE	BBR Lotec
8	8	Mike Keely	Associated 12L	U	Novak M1c	Airtronics	DC Racing	Bud's Nissan	Du-Mor/Associated
9	7	Steve Boice	Woods Exterminator	T	Tekin 411P	KO Propo	Advantage	Andy's Lotec	Associated
10	4	Sean Cochran	Delta Super Spyder		Tekin 411G	KO Propo	A&D Select Cells	Bud's Nissan	Delta Green

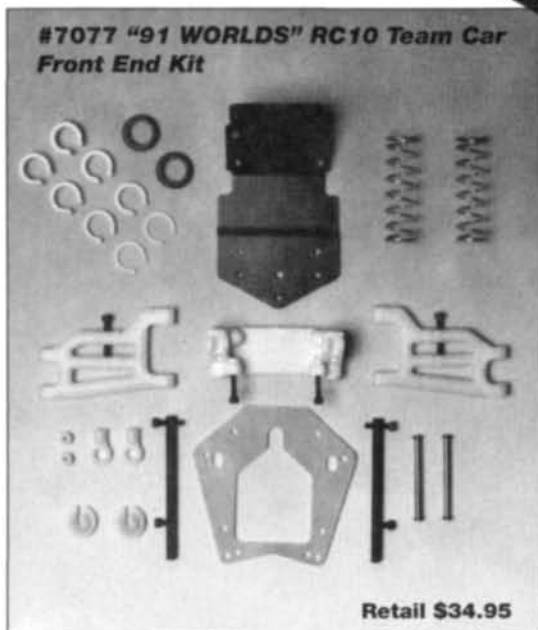
Body	Tires	Sponsors
Associated Nissan	TRC ZR1	Trinity, TRC, Novak, Airtronics, Tecnacraft, Magic Motorsports, Turbocharger, Competition Electronics
BBR Lotec	Associated	Reedy, Associated, Novak, Paragon, Airtronics, BBR, Team Arlington, Du-Mor R/C, GPA Hobbies
Andy's Lotec	TM/Du-Mor PD Positrac	Class Recreational Products, DuMor, Trinity, TM Racing Components, Team Class Racing, Andy's
Bud's Nissan	TRC Yokomo	Composite Craft, TRC, Trinity, Novak, Futaba
Associated Nissan	Associated/Yokomo	Associated, Reedy, Advantage, LAVco
Associated Nissan	TRC/Yokomo	East Coast Modified, TRC, PTI/Advantage, Novak
Associated Nissan	ProStar	Novak, Associated, Reedy, Paragon, Bud's, ProStar, Du-Mor R/C, Power Push Batteries
Bolink Nissan	TRC ZR1	Texaco Havoline, East Coast Modified, Novak, Associated, TRC, Bolink, Advantage Matched Batteries, Bud's
Bolink Porsche	TM/Du-Mor PD Positrac	Du-Mor, Corally, Twister, Tekin, Racer's Choice, Turbocharger, Team Smooth, Bolink
Associated Nissan	TRC	CAM, Associated, Novak, TRC, KO Propo, Tecnacraft, HPI, Team Arlington, LAVco, Du-Mor R/C



This is the same front end set-up Team Associated used on their RC10 Team Cars at the 1991 World Championships in Detroit. Everything you need to convert your ALUMINUM PAN RC10 is in this kit except the recommended Associated 1.02 shocks.

This front end is designed to work best on a rough track because of the added suspension travel of using a narrow kickplate and bulkhead, with longer arms.

All the injection molded parts are made of white dyeable nylon.



#### #7375 Losi Swept Front Arms

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Overseas Distributors: G & M Trading-Australia, H.L.F., Inc.-Japan, Keil Germany, Hartley Brown-Canada, Speedy Cars-France, Thor Racing - U.K., Send \$2.00 cash for catalog and decals - 14978 Sierra Bonita Ln., Chino, CA 91710

## LETTERS

(Continued from page 127)

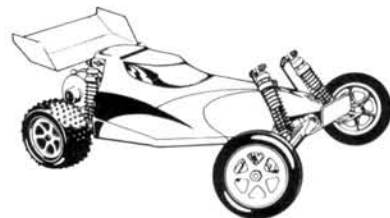
of Lexan paint in every color imaginable. Brush or spray on the first color, and let it dry overnight. Then peel off the masking tape to expose the area you want to paint next. Wash this newly exposed area lightly to remove any masking tape residue, and start with the next color. AS

### QUICK QUESTION

I plan to buy a Tamiya Monster Beetle, and I was wondering if you've done a "Track Report" on it. Great mag, keep up the good work, and good luck to Steve!

DANIEL DOW  
Morgan Hill, CA

For information on the Monster Beetle, check out Steve Pond's review in our August '87 issue. Thanks for the compliments! AS



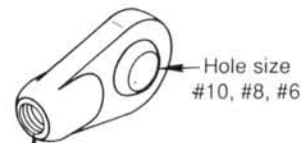
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# *Radio Control* **Racer**

144 • **Car Action/Sanyo's  
Reedy Race of Champs**

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155 • **How to Make an  
External Battery Pack**

158 • **ERP Master Zapper**







PHOTOS BY YAMIL SUEZ

Satoshi Kayano of Japan positions a teammate's car on the starting grid. Satoshi races for Team Yokomo in 4WD and Team Associated in 2WD.



CAR ACTION/Sanyo

# Reedy Race of Champions

**W**HEN SOMEONE asked Mike Reedy what his dream birthday present would be, he answered, "To watch the best drivers in the world compete against one another." Six years ago, he was granted his wish at the first Reedy Race of Champions, and it has subsequently become an annual event that's traditionally held on Reedy's birthday.

Thirty of the world's top off-road drivers compete in a special Invitational Class at Radio Controlled Hobbies (RCH) in Costa Mesa, CA. (The first two events were held at Hot Trax in Huntington Beach.) They're separated into four heats, and they're "shuffled" so that they can compete with different racers in each of Saturday's six 2WD rounds and Sunday's six 4WD rounds. Points are awarded according to how each driver finishes, i.e., one point for 1st place, two for 2nd, etc., and the drivers are allowed to "throw out" their worst score of the day. Whoever has the *fewest* points at the end of the event wins.

Open Classes for 2WD and 4WD cars are also part of the Reedy Race schedule. Any driver can enter these classes, and the winner of each is eligible to participate in the following year's Invitational Class.

b y F R A N K M A S I







Left: We began to worry about Ron Rosetti...he dressed in an unusually conservative manner for the first two days of the race. We realized that our worries were unfounded, however, when he appeared on Sunday dressed in his usual "skate-rat" attire.



Here's Cliff Lett, "wrenching" on his Associated Team Car between rounds in the Invitational Class. Owing to his consistent driving, he finished 4th overall.

*Hohwart wins the race!*



Above: Here's Invitational Class winner Rick Hohwart with his winning 4WD Kyosho Lazer ZX-R. He used an Associated Team Car in 2WD, and both rides were powered by Peak Performance motors and Team Orion batteries.



RADIO CONTROL  
**Racer**



## MAKING THE GRADE

To qualify for the Invitational Class, a driver must meet one of the following requirements: be a past or present IFMAR World Champ; be an A-Main finalist at the preceding IFMAR Champs, European Champs, ROAR Off-Road Nats, or Japanese Nats; be the Open Class winner or one of the top five Invitational Class finishers at the previous year's Reedy Race.

## WORLD-CLASS COMPETITORS

This year's Invitational Class boasted a veritable "who's who" of off-road driving talent. From Japan came Masami Hirotsuka, five-time world champ and the '91 Invitational Class winner; Satoshi Maezumi, '91 Worlds 2WD and 4WD A-Main finisher who was one of only three



Hirotsuka and his teammate Kayano discuss a race strategy. They spoke in Japanese, so we could only guess what they said.

Anfinson, Kris Moore, Derek Furtani, Mark Pavidis, Mark Francis and Scott Montgomery; '91 ROAR 2WD stock and modified national champ Kyle Reed; and '91 ROAR Nats A-Main finishers Rick Hohwart, Brian

was Hirotsuka); and European Champs finalists Rory Cull, Phil Davies, Jamie Booth and Marc Neal.

In addition, LRP president and Team Schumacher driver Jurgen Lautenbach represented Germany in the battle for the Invitational Class crown.

## REEDY RACE SITE

The RCH facility offers racers everything they could want: a large, well-ventilated indoor track; a pit area with AC power for everyone; a full-service snack bar; and a well-equipped hobby shop. The track consists of a unique clay mixture. I've never before encountered a racing surface quite



Kayano runs an RC10 that's virtually identical to Masami's; except for its main color, even the paint is the same. Lett put some of his own custom decals on Kayano's car. See if you can spot them!

**"Although the Reedy Race isn't sanctioned by any organization ...the prestige and "bragging rights" associated with winning it make it nearly as significant the World Champs!"**



drivers to make both; Hiromitsu Kimoto, Hiroyuki Matsumoto and Satoshi Kayano, all A-Main finishers at the Japanese Nats.

The U.S. team was out in full force and led by '91/'92 4WD World Champ, Cliff Lett. Joining him were Rick Vehlow, 2nd-place finisher at the Worlds; Jammin' Jay Halsey, first-ever off-road world champ; Worlds finalists Jack Johnson, Scott

Kinwald, Carlos Gonzales, Jonathon Morgan, Greg Hodap and Brett Reelfs. J.D. Beckwith, who finished in the top five at last year's Reedy Race, also participated.

All the top English drivers were there, too. This included Craig Drescher, 2WD A-Main finisher at the '91 Worlds; Kevin Moore, another of the three drivers who made both A-Mains at the Worlds (the third

like it. "There's no track like RCH in the world," said Team Losi's Johnson. "It requires a completely different setup than anywhere else." I agree. No matter what the crew does to the track—rake it, rototill it—



## 2WD OPEN

Fin.	Qual.	Name	Chassis	Motor	ESC	Radio
1	1	Scott Roberts	Assoc. RC10	Peak	Novak	Airtronics
2	8	Matt Francis	Assoc. RC10	Reedy	Novak	Airtronics
3	9	Jason Foster	Assoc. RC10	Reedy	Novak M1c	Airtronics
4	10	Robert Hoffman	Losi Pro SE	ERP	Novak M1c	Airtronics
5	4	Chris Walrod	Assoc. RC10	Peak	Tekin 411G	Airtronics
6	6	Bryan Peterson	Losi Pro SE	Revolution	Novak M5	Futaba
7	3	Daren Westman	Assoc. RC10	Reedy Mr. X	Novak M5	KO Propo
8	5	Brent Wallace	Assoc. RC10	Reedy Mr. F	Novak M1c	Futaba
9	2	Aaron Biner	Assoc. RC10	Reedy	Tekin	Airtronics
10	7	Dan Carter	Assoc. RC10	Reedy Mr. H	Novak	Airtronics



## 4WD OPEN

Fin.	Qual.	Name	Chassis	Motor	ESC	Radio
1	2	Brent Wallace	Schumacher	Reedy Mr. H	Novak MXc	Futaba
2	7	Chris White	Kyosho Lazer	Peak	Tekin	Airtronics
3	1	Aaron Biner	Yokomo Works	Reedy	Tekin	Airtronics
4	4	Jim Gard	Yokomo YZ-10	Quarterflash	Tekin	Airtronics
5	9	Daren Westman	Schumacher	Reedy Mr. X	Novak M5	KO Propo
6	10	Hideki Kajiwara	Kyosho Lazer	Trinity	Tekin 420F	Airtronics
7	8	Tamotsu Yamamoto	Yokomo YZ-10	Reedy	Novak	Futaba
8	6	Randy Locken	Kyosho Lazer	Reedy	Novak	KO Propo
9	5	Chris Allec	A&L Lazer	Peak	Novak	Kraft
DNS	3	Vince Stollo	Kyosho Lazer	Precision	Tekin 411G	Futaba



the dirt never becomes loose or fluffy. (It's kind of like racing on brownie batter!)

The layout (designed by Gary Demory) challenged even the Invitational drivers! A long straightaway led to a sweeping, 180-degree right-hand turn. This was followed by a medium table-top jump that the drivers had to take carefully. (It was best to just clear the table-top portion and then land perfectly on the "down side." Next, there was a sharp, 180-degree left turn that led to another table-top. The drivers tried to land on the down side of this jump, using it to help them accelerate along a short straight that led to a wide right-hander. This was followed by a straightaway with a step-up jump in the middle of it.

At the end of the straight came a difficult section that consisted of an S-type switchback, i.e., the drivers had to make a fast left and then a fast right, and a set of small triple jumps. (The fast cars cleared all three; those that weren't so fast ended up on their roofs!) Beyond the triples were a right turn, a 12-foot-diameter "keyhole" left turn and then a final right turn that led back to the main straightaway.

### INVITATIONAL 2WD CLASS

In the first round, Drescher and Gonzales (with Francis just 2 seconds behind him) each won a heat. In a crowd-pleasing battle, Beckwith edged out Associated teammate Lett by just .9 second. Hohwart was the round's fourth victor.



Left: England's Phil Davies runs a Schumacher Pro Cat in 4WD and a Cougar II in 2WD. Right: British driver Rory Cull checks the static adjustments, i.e., camber and toe-in/out, on his RC10 Team Car. Behind him is fellow countryman Craig Drescher, who drove impressively and finished 6th overall.

In round two, Kinwald, Pavidis, Vehlow (who's now driving for Traxxas) and Beckwith took the laurels, while round three saw Pavidis, Anfinson, Kinwald and Hohwart in the winners' circle.

At this point, you're probably wondering about Hirosaka. (I know that I was.) He

had a terrible day! He was banged around a lot, and he even lost a front wheel in one of the heats! He rectified the situation with a decisive victory over Drescher in round four. Beckwith won another heat, giving him a total of three wins, and Pavidis and Hohwart both won their heats.

Batteries	Body	Tires (f/r)	Sponsors
Team Orion	RCPS	Losi rib/X-pattern	Peak Performance, Team Orion, Novak, MIP, Kimbrough, TZ Kustomz
Ultimate	RCPS	Losi rib/Kyosho soft	Associated, Reedy, Ultimate, C&B
Reedy	RCPS	Pro-Line 7015/7082	Associated, Reedy, Pro-Line, RCHR, Airtronics
Reedy	Losi	Losi rib/X-pattern	ERP
Team Orion	RCPS	Losi rib/Yokomo TR35	Peak Performance, ERP, RPM, Tekin, RCHR, Scat Racing, Waldo Racing
Trinity Pushed	Losi	Losi rib/X-pattern	Team Losi, Trinity, Jammin' Products
Reedy	RCPS	Losi rib/X-pattern	Associated, Reedy, Schumacher, KO Propo, Novak, Du-Mor
Reedy	RCPS	Losi rib/X-pattern	Associated, Reedy, Schumacher, Futaba, Novak, RCPS, MIP, Zero N4 Hobbies
Perfect Match	RCPS	Losi rib/X-pattern	Hobby Haven, Team Blockhead
Reedy	RCPS	Losi rib/X-pattern	Reedy, Associated

Batteries	Body	Tires (f/r)	Sponsors
Reedy	Pro Cat	Kyosho Fuzzies (f/r)	Associated, Reedy, Schumacher, Futaba, Novak, RCPS, MIP, Zero N4 Hobbies
Excell	Kyosho	Kyosho (f/r)	Traxxas, Excell Racing, Lunsford, Raceway Hobbies, Kit Car
Perfect Match	RCPS	Kyosho Fuzzies (f/r)	Hobby Haven, Team Blockhead
Bel-Ray	Yokomo	Losi 4-row/X-pattern	Quarterflash, Scat Racing, SRS, Messina Rentals
Reedy	RCPS	Losi ribs/X-pattern	Associated, Reedy, Schumacher, KO Propo, Novak, Du-Mor
J-Power	Kyosho	Kyosho 5632/5642	Kyosho, J-Power
Reedy	Yokomo	Losi X-pattern (f/r)	Reedy, Hobby Haven, Team Blockhead
Reedy	Kyosho	Kyosho 5642 (f/r)	Reedy, Associated, Novak, RCPS
Team Orion	A&L	Kyosho 5642 (f/r)	A&L, Novak, Peak Performance, Team Orion
Precision	Kyosho	Kyosho Fuzzies (f/r)	Precision Motorworks, M&M Hobbies & Raceway



By round five, the track had begun to "go away," and it took its toll on the drivers. (There were more accidents and slower lap times.) Drescher, Gonzales and Kinwald each won a heat in this round, but the best pass of the weekend happened in the third heat. Reed shot out into the lead, followed by Hohwart, who drove his RC10 so hard that, for about 2 minutes, it was practically stuck to the back of Reed's JRX-Pro SE! Then Hohwart went for it. Over the step-up jump in front of the drivers' stand, he flew past Reed diagonally in midair! Reed paid him back over the triples and hung on for win, but, boy, what a race!

In the sixth, and final, round, Gonzales, Pavidis, Francis and Lett walked away with wins.

In the final tally for Saturday's 2WD Invitational Class, Pavidis held the lead with six points (after he had thrown out his worst score), and Hohwart, Gonzales and Kinwald were in a three-way tie for 2nd with seven points each.

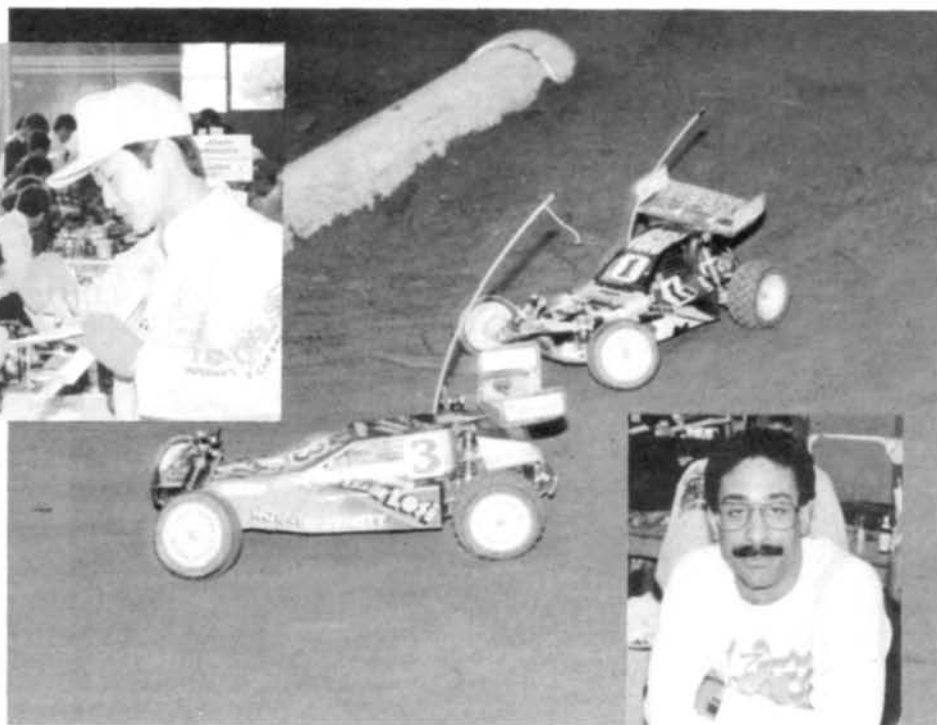


**Brian "the Legend of RCH" Kinwald hams it up for the camera. His superb driving entertained the crowd and netted him 3rd-place overall.**

### OPEN CLASS 2WD

There were 120 entrants in the 2WD Open Class, and each racer hoped for a qualifying time that would put him in the A-Main. Peak Performance driver Scott Roberts grabbed the lead early and retained the TQ position throughout the event. Aaron Biner filled the 2nd-place qualifying slot, followed by Daren Westman, Chris Walrod and Brent Wallace.

From his pole-sitting starting position, Roberts shot ahead of the pack. At the 2-minute mark, he "biffed," and Jason Foster, Robert Hoffman and Walrod came within striking distance. Many would have cracked



**Above left: Current 2WD world champ Masami Hirosaka explains something about the race to another Japanese competitor. Check out those driving gloves! Right: Novak's Tyree Phillips was on hand to help Team Novak drivers or anyone who had trouble with his company's products. He didn't have much to do, so he earned the title of "the Maytag repairman of R/C."**

under the pressure, but Roberts kept his cool and held his position. Bryan Peterson made a late-race charge with his Losi Pro SE and took 2nd for a while. He made one slight mistake, though, and dropped back to 6th. At the 4-minute mark, it was Roberts in 1st, with Matt Francis (who came from 8th place) in 2nd. Foster crossed the line in 3rd followed by Hoffman and Walrod.

### OPEN CLASS 4WD

Biner and Wallace duked it out during all four 4WD Open Class qualifying rounds. Biner eventually placed his Yokomo Works '91 in the TQ spot, followed by Wallace's Schumacher Pro Cat and Vince Stollo's Lazer.

In the A-Main, Biner bobbled at the start and dropped back a few spots, allowing Wallace and 7th-place qualifier Chris White to slide by. Wallace was out in front and clear of traffic, but he couldn't put much distance between his car and the 2nd- and 3rd-place cars of White and Biner.

The real battle was for 4th place. Tamotsu Yamamoto and Hideki Kajiwaru from Japan duked it out with Americans Jim Gard and Westman. Wallace held his lead and crossed the finish line 1 second short of making the extra lap. White and Biner also held their positions. Gard held off Westman, Kajiwaru and Yamamoto to take 4th.

### 4WD INVITATIONAL CLASS

The Europeans and the Japanese hoped to score big in 4WD—the most popular form of off-road racing in their countries.

In the first round, Hirosaka demonstrated why Yokomo keeps him on their payroll by driving a nearly perfect race and scoring his second win of the weekend. Furtani also excelled in his heat. Front-runners Beckwith and Kinwald also posted 1st-place finishes.

In round two, 2WD Invitational Class leader Pavidis felt the pressure of a 5th-place finish in round one, and he only managed a 3rd-place finish. Hirosaka and Beckwith continued their winning ways, and Lett and Johnson picked up their first 4WD wins.

After his discouraging 4th- and 7th-place finishes in the previous rounds, Drescher won his heat in round three. Hohwart was right in the thick of things with several 2nd-place finishes, including one in this round. Lett, Beckwith and Hirosaka, who seemed unbeatable in 4WD, all won.

By round four, the pressure had built up. To win, the drivers couldn't make any mistakes. Hirosaka won his heat, but Beckwith was right on his tail. Moore, Furtani and Hohwart were also victorious.

Lett and Kinwald gave the crowd an awesome display of driving in the fifth round. Kinwald shot out to the lead, with

## INVITATIONAL CLASS POINTS-STANDING CHART

Points were awarded according to how the drivers finished, i.e., one point for 1st place, two for 2nd, etc., and the drivers were allowed to "throw out" their worst score of each day. (These scores are noted in bold.) Whoever finished with the *fewest* points at the end of the event was the winner.

Fin.	Driver	2WD						2WD Total	4WD						4WD Total	Total Points
		1	2	3	4	5	6		1	2	3	4	5	6		
1	Rick Hohwart	1	2	1	1	2	4	7	2	2	2	1	4	1	8	15
2	J.D. Beckwith	1	1	3	1	6	3	9	1	1	1	2	3	1	6	15
3	Brian Kinwald	3	1	1	2	1	2	7	1	3	7	2	1	4	11	18
4	Cliff Lett	2	3	3	3	2	1	11	4	1	1	3	2	6	11	22
5	Jack Johnson	3	3	2	3	2	3	13	2	1	2	3	8	1	9	22
6	Craig Drescher	1	5	2	2	1	3	9	4	7	1	5	1	2	13	22
7	Mark Pavidis	2	1	1	1	3	1	6	5	3	2	4	6	4	18	24
8	Masami Hirosaka	5	8	6	1	3	4	19	1	1	1	1	3	1	5	24
9	Mark Francis	2	4	3	6	3	1	13	7	3	2	2	2	5	14	27
10	Carlos Gonzales	1	2	2	8	1	1	7	8	6	7	3	1	4	21	28
11	Greg Hodap	3	4	4	4	4	2	17	3	2	3	2	7	2	12	29
12	Rick Vehlow	2	1	4	6	5	2	14	6	2	4	4	2	3	15	29
13	Kris Moore	7	4	3	5	2	7	21	2	3	5	1	5	3	14	35
14	Derek Furtani	7	5	5	4	4	5	23	1	4	3	1	5	5	14	37
15	Jonathon Morgan	6	3	7	2	6	5	22	6	4	5	4	1	3	17	39
16	Scott Anfinson	3	2	1	3	3	2	11	3	7	5	7	7	7	29	40
17	Kyle Reed	4	6	2	2	1	6	15	7	5	4	5	7	4	25	40
18	Satoshi Kayano	7	5	7	5	7	6	30	3	5	3	7	4	3	18	48
19	Marc Neal	4	3	6	3	4	6	20	7	8	6	5	4	7	29	49
19	Kevin Moore	5	7	5	7	4	4	25	4	4	6	5	7	5	24	49
21	Jamie Booth	6	6	8	5	8	8	33	2	7	4	8	2	2	17	50
22	Scott Montgomery	4	6	5	7	6	8	28	6	6	4	4	5	6	25	53
23	Brett Reelfs	6	7	8	7	6	6	32	5	5	7	3	6	2	21	53
24	Satoshi Maezumi	5	6	4	4	7	5	24	8	6	5	6	6	7	30	54
24	Hiroyuki Matsumoto	8	8	5	8	7	7	35	3	5	3	7	3	5	19	54
24	Rory Cull	5	5	7	6	5	3	24	6	4	6	6	8	8	30	54
27	Jay Halsey	7	2	6	4	7	7	26	4	7	8	8	3	7	29	55
28	Jurgen Lautenbach	4	<b>DNS*</b>	4	6	5	5	32	5	2	8	6	4	6	23	55
29	Phil Davies	8	4	6	5	5	4	24	7	8	7	6	5	8	33	57
30	Hiromitsu Kimoto	6	7	7	7	8	7	34	5	6	6	7	6	6	29	63

\*A DNS is given eight points; this score can't be thrown away.

Hirosaka and Lett on his rear bumper. Kinwald held on until the 12th lap, where he made a mistake, and Hirosaka slid by. It looked as if Hirosaka would take another win, but he got stuck on a back marker in



The racers were allowed to use the larger, 2.2-inch rims. To enlarge his Losi X-pattern tires, Jack Johnson attached a 3/4-inch section to each with CA and a lot of patience.

the 13th lap, and Kinwald passed him, followed by Lett. Lett tried every trick in the book, but Kinwald wouldn't have it, and he held on for the win. (Lett finished a

mere .23 second behind him!) Drescher scored a win, and Morgan and Gonzales (who finally got the gremlins out of his Lazer) picked up their first wins of the day.

Round six was the deciding round. The battle for 1st was between Beckwith and Hohwart who were tied. Jack Johnson won his heat over Hodap, and Hirosaka picked up his 5th 4WD win. Hohwart and Beckwith each placed 1st in their respective heats so, to break the tie, their throw-away heats were taken into account.

### AND THE WINNER IS...

Hohwart threw away his two 4th-place finishes and emerged with a one-point lead over Beckwith, who threw away a 6th- and a 3rd-place finish.

Although the Reedy Race isn't sanctioned by any organization (it's really just for fun), the prestige and "bragging rights" associated with winning it make it nearly as significant the World Champs! After all, Hohwart beat the world's best drivers.

Car Action is grateful to those who made

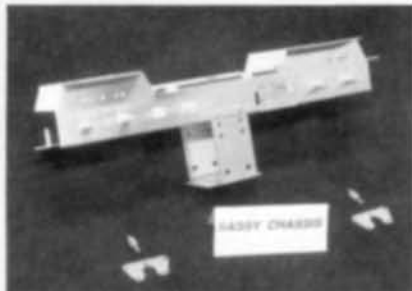


Teamwork: Masami and his father, Masaaki, really take their racing seriously. Here, Masaaki, who worked on the cars at night, grabs a few winks between heats.

this event possible: the drivers; the track crew; track director Herb Hanns; score-keeper/announcer Debbie Sears; track manager Jeff Paul; and, of course, RCH owner Ron Williams. Thanks also go to Patricia Takeda and Sanyo for co-sponsoring the event. And, last but not least, a big round of applause for Mike Reedy. Happy birthday, Mike! Joyce says, "Yo!"



# SPEED *SHOP*



## SASSY CHASSIS

### • Aluminum Clod Buster Chassis

This standard-length aluminum chassis is heavy-duty, yet lightweight. It has eight shock-mounting locations and a built-in adjustable lift kit, which provides almost 2 inches of shock travel without

changing the wheelbase. It has pre-drilled holes for triple shocks, and you can bolt stock components directly onto it.

Part no. 9950

Price: \$89.95

For more information, contact Sassy Chassis, 906 Ridgewood Dr., Cary, IL 60013.



## PRO-LINE

### • RED Worlds Tires

Pro-Line's engineers designed the RED series of tires specifically for the soft- to medium-packed track at the '91 Worlds in Detroit, MI. The series was used throughout the big event by Team Associated and Pro-Line team members. The front RED spike tire that's pictured here fits 2.1-inch wheels.

Part no. 7075

Price: 9.95 per pair

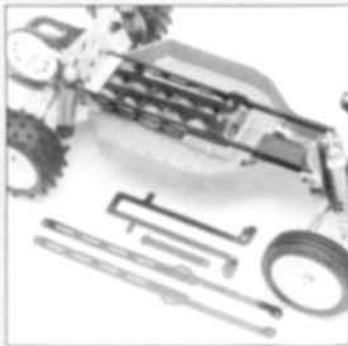
For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA 92223.

## SOUTHWEST TIRE

### • Tire Selection

Specializing in 1/10- and 1/12-scale on-road, Southwest offers tires in 10 grades of rubber and wheels in seven styles. Special diameters and colors are also available. Southwest is also an authorized Fantom distributor.

For more information, contact Southwest Tire, 13 Jardin Rd., Los Lunas, NM 87031.



## A&L

### • Chassis Stiffener/Battery Mount

Designed for use with RC10 and RC10T tub chassis, A&L's new stiffener is also a quick-release battery-mounting system. It greatly strengthens the chassis—preventing bending and "tweaking"—and holds the batteries in place securely.

Part no. 2200

Price: \$16.75

For more information, contact A&L Mfg., P.O. Box 2115, Corona, CA 97118.

Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by *Radio Control Car Action*, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in *Radio Control Car Action*.



#### SAIKO • Pro Brush Cutting Kit

For years, the pros have known that properly tuned brushes improve a motor's performance, and now you can learn their secrets! The detailed instructions in Saiko's Pro Brush Cutting Kit have hot brush-tuning tips. The kit also

includes a rugged, hard-anodized-aluminum jig, a high-quality cutting file and a storage case with brush compartments and space for two motors.

Part no. 2010

For more information, contact Saiko Racing Products, P.O. Box 1515, Tustin, CA 92681.

#### PARAGON • 64-Pitch ProLite Spur Gears

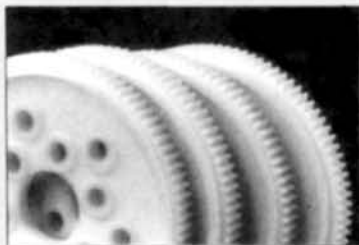
Paragon's 64-pitch 97-, 99-, 105- and 107-tooth spur gears are now available in "cut" versions, i.e., they're milled to reduce

weight, friction and noise.

Part nos. PL097 (97-tooth); PL099 (99-tooth); PL105 (105-tooth); PL107 (107-tooth).

Price: \$6.25

For more information, contact Paragon Racing Products, Dept. CA2, 690 Industrial Cir. S., Shakopee, MN 55379.

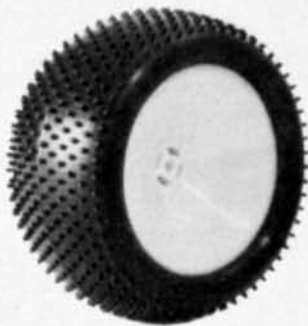


#### ERP

##### • Cactus Juice

ERP's Cactus Juice Power Drops is a new commutator and brush solution that prevents the oxidation that develops on commutators. Just put a drop on the face of each brush, wipe off the excess, and you're ready for increased power that will last the entire race. Available in 1/2-ounce micro-needle dispensers and in 2-ounce refills.

For more information, contact Endurance Racing Products, 826 N. Lamb, Las Vegas, NV 89110.



#### PRO-LINE

##### • Pro-82 Fuzzie Tires

Pro-Line's newest addition to its Series line of 2.15-inch-diameter tires—the Pro-82 ultra-mini-pin Fuzzie—is made of a blend of lightweight rubber. It increases stability and traction for serious racing performance, and its many mini-pins improve handling on medium- to hard-packed surfaces.

Part no. 7082

For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA 92223.

#### TRAXXAS

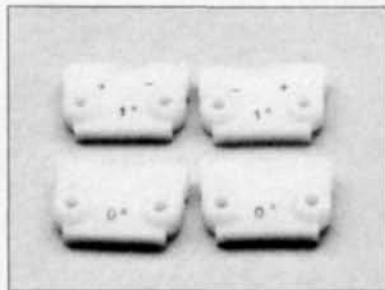
##### • Blue Eagle Rear Toe-In Adjustment

These suspension-arm mounts enable you to adjust the rear toe-in on the Traxxas Blue Eagle. They increase the ground clearance and slightly increase the rear track width. The 0-degree blocks won't alter the stock 4 degrees of toe-in, and the  $\pm 1$ -degree blocks let you increase or decrease toe-in (depending on how they're installed) by 1 degree.

Part nos. 2797 (0 degree); 2798 ( $\pm 1$  degree).

Price: \$2

For more information, contact Traxxas Corp., 12150 Shiloh Rd. #120, Dallas, TX 75228.





# KILLER CLOD PARTS!

**JPS HAS IT!** Super-strong machined billet aluminum gearboxes are a direct replacement for the stock plastic components, and feature an adjustable motor mount for a wider range of gear ratios. The ultimate Clod accessory for full-pull strength!

JPS' Aluminum Clod rims are available for either standard tires or dually IMEX-style tires in over a dozen styles. And, check out our new aluminum bumpers, Axle tubes, and ladder bars! For the Killer Clod- JPS HAS IT!



• MACHINED CLOD GEARBOX #7000

**NEW!**  
STEEL GEARS  
NOW  
AVAILABLE!



• BILLET ALUMINUM AXLE TUBES AND LADDER BARS

MADE IN U.S.A.

SOLD IN PAIRS



• SINGLE AND DUALY CLOD RIMS

**JPS CUSTOM WHEELS**

SEND 1/2" FOR CATALOG AND STICKER

P.O. Box 3014, Dept. CA, Fullerton, CA 92634  
(714) 738-1912 FAX: 738-0829

## CLEVELAND CHAMPS

(Continued from page 129)

Ohio area and Canada. Problems, conflicts, and protests were handled quietly—and, in most cases, privately—and efficiently.

### SUNDAY MAINS

On Sunday, the Mains were run in ascending order, with the excitement and energy growing and growing until the two feature events: Stock A-Main and Modified A-Main.

Stock may not be as blisteringly fast as Modified, but for many, it's more challenging to wring the best possible performance out of a 27-turn, 24-degree motor. This year, Willy Decker's performance in qualifying—a blistering 37-lap run for TQ—put him on the pole, but talking about "pressure" for the Stock event. Decker definitely didn't buckle, and he led the Sportsman event from start to finish.

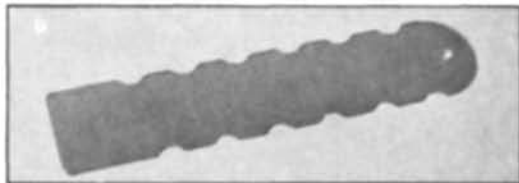
In Stock, escaping the brutal bashing of turn one and just about every subsequent turn in the infield, Decker was able to get away cleanly and stay clean, opening up lots of space between his car and those of David Heath, Mike Marshall and Jim

(Continued on page 174)

# PARTS, PARTS... WE'VE GOT PARTS!

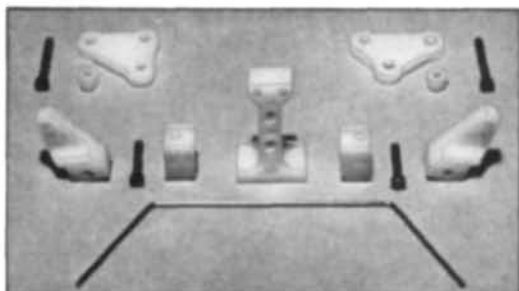
## STOCK CAR BODY POSTS M-1609

THESE LIGHTWEIGHT MACHINED ALUMINUM BODY POSTS ARE 2 1/2" HIGH, PERFECT FOR STOCK CAR OR TRUCK BODIES AND VIRTUALLY INDESTRUCTIBLE.



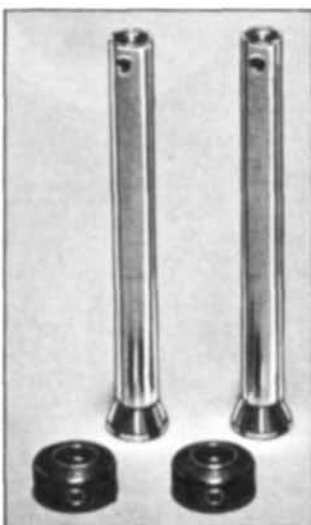
## AEROTENNA A-437

DESIGNED TO HOLD RECEIVER ANTENNA UNDER THE BODY FOR LESS DRAG ON HIGH SPEED TRACKS.



## OVAL LOWERING KIT FOR RC-10 1990 OR LATER MODEL - A-418. EARLY MODEL ALUMINUM CHASSIS - A-431.

COMPLETE SUSPENSION KIT FOR REMOVAL OF HIGH SHOCK TOWERS. ALLOWS LOW PROFILE BODY MOUNTING. NO SHOCKS INCLUDED.



## FRONT BUMPER & REAR BODY BRACKET FOR RC-10 A-433 FRONT, 1-434 REAR

CUT, BENT, AND ANGLED TO FIT ALL RC-10 CHASSIS. GREAT FOR OVAL OR TRUCK CONVERSIONS.



## BODY MOUNTING KIT A-406

PLASTIC BODY POSTS AND SPACERS WITH VARIETY OF SCREW LENGTHS FOR CUSTOM BODY MOUNTING.



SEND \$2.00 FOR COMPLETE CATALOG  
McAllister Racing  
1000 N. Humphreys St., Ste. 204  
Flagstaff, AZ 86001



HOW TO MAKE AN

# External Battery Pack

by PAUL HENKE

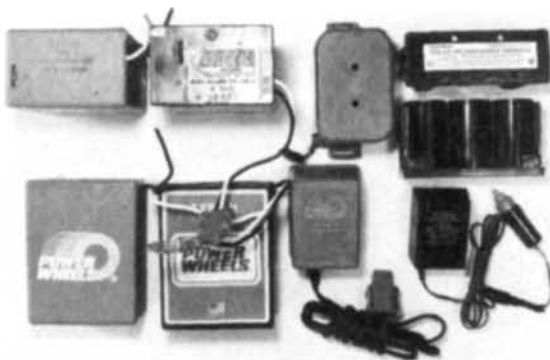
I'VE FOUND an easy way to save money on an often overlooked R/C expense—transmitter batteries. As we all know, the eight AA alkaline batteries that power transmitters don't last very long. With moderate use, I often went through eight cells in only two weeks (and that's not counting the many times I accidentally left my transmitter on overnight!). AA batteries aren't cheap; eight cost nearly \$6. Before long, this adds up to a lot of money—not to mention the piles of AA batteries in landfills.

Of course, I've tried using AA Ni-Cds, but they don't work very well, because you sacrifice both amps and volts. Eight non-rechargeable cells connected in series produce 12 volts, but eight AA Ni-Cds total only 9.6 volts. Losing 2.4 volts decreases the radio's range, and this makes interference and glitching more likely.

There *is* a way, however, to get a full 12 volts of dependable, long-lasting, rechargeable power, and it's surprisingly easy and inexpensive. Build your own external battery pack from inexpensive gell-cells and start saving money!

## CELL HUNTING

Finding the proper battery should be your first objective. Be sure that you buy a gell-cell or lead-calcium battery.



*Various gell-cells. Left to right: two sets of 6V kiddie-car batteries with charger, a lawn-mower battery, two Radio Shack 6V 6A cells with charger.*

Gell-cells are completely sealed, extremely difficult to overcharge and will work in any position. Don't use a lead-acid battery (one that requires an added electrolyte solution and isn't sealed); they're prone to hazardous electrolyte leakage.

Your power pack must meet three requirements:

- It must produce 12 volts (you can also use two 6V gell-cells joined in series).
- The amp/hour rating can range from 2.5Ah to 10Ah. Don't worry about the raw power of these batteries; your transmitter will only draw as much power as it needs.
- You should be able to carry it over your shoulder or around your waist; it shouldn't interfere with your driving.

To find a gell-cell that suits your needs, you may have to hunt around at a few hardware stores or hobby shops. Keep in mind that gell-cells are used in many common items, including electric kiddie cars, power tools, lawn and garden equipment, camping power supplies and video-camera power packs.

Tower Hobbies\* sells an excellent gell-cell called the "Mafrec" (maintenance-free rechargeable) and a UL-listed charger that goes with it. When I made my power pack, I used two Radio Shack 5A 6V batteries; I also bought my charger there. Remember, you're trying to save money, so don't spend more than \$30 on both.

*(Continued on page 156)*



*Here are two 12V gell-cell packs; each was made by joining two 6V packs.*



## BATTERY PACK

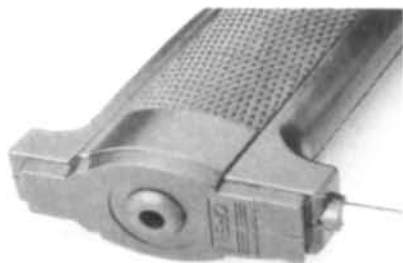
(Continued from page 155)

Gell-cells are very resistant to overcharging, but discharging them may damage them. Don't treat them as you would Ni-Cds; keep a good charge in them when you're not using them. I leave my power pack on the charger whenever I'm not racing with it.

### PLUG'N ALONG

After you've bought the battery and charger, decide which type of plugs and wire you want to use. You'll probably want to use your power pack for more than one radio, so make the pack easy to adapt. I strongly recommend that you use cigarette-lighter plugs and curly cord. If you use cigarette plugs, you'll be able to use your power pack to run other handy items, e.g., soldering irons, portable air compressors, camcorders, and portable stereos.

You can find these plugs, with curly cord already attached, at an auto-parts



*To prevent wires from becoming frayed, install a rubber grommet in the battery compartment.*

store. Look for a plug extension kit; it includes male and female plugs and enough curly cord for two radios. If you can find them, buy cigarette plugs with built-in fuses. The fuse will protect your radio from serious damage. Try to spend no more than \$5 on cord and plugs for each radio that you want to adapt.

To assemble your power pack, solder the plug to the battery poles. If you use two 6V batteries, join them in series by soldering a piece of wire from the positive lead on the first battery to the negative lead on the second battery. Then, attach the plug to the remaining poles. To prevent shorting, insulate all exposed wire. To minimize stress on the solder joints, tape the wire that leads to the plug to the side of the battery. Remember, this wire will crack



*Carry the battery in a pack around your waist and you'll be ready for hours of racing.*

much more easily than silicone-covered racing wire will.

### RADIO ADAPTATION

Now, you can start to adapt your radio. All radios can be converted, but some are easier to convert than others. Open the battery compartment and remove the tray. You should see two metal knobs sticking out of one end. When the battery tray is in the radio, these knobs make contact with either two metal tabs or two springs.

To determine which knob and its corresponding contact is positive (+), or negative (-)—if they aren't already marked—trace the current through the tray with a digital voltmeter. Make sure that you get the polarity right; if you reverse it, you may destroy your radio. Etch



*If your radio has tabs inside the battery compartment, connect the cord directly to the tabs with spade connectors. Notice the knot that prevents the wires from pulling loose.*

(+) and (-) symbols next to the corresponding knobs and contacts so that you don't forget them later. The rest of the adaptation will depend on whether your radio has tabs or springs.

### TABS

If your radio has metal tabs (as shown in the pictures), adaptation should be a breeze. Bend the tabs upward so that they stick straight out. When you bend the tabs, go slowly and don't stress the metal. Try to find connectors that fit these tabs; they're called "side connectors" or "stake-on plugs," and they're available at most hardware stores. If you can't find a connector, you'll have to solder the wire directly to the tabs.

Before you can connect the curly cord to the radio, you must take steps to take stress off the new joint. Drill a hole in the battery compartment cover. Put a grommet in the hole, or line its sides with tape to prevent the plastic from cutting into the cord. Then, push about 6 inches of cord through the grommet and tie a knot on the other side, making sure that there's enough wire to finish the connection.

Now, you can make the final connections. Strip the wire and solder it to the connectors or directly to the tabs. Be sure to insulate all the exposed wire. If the cigarette-lighter plug (male) isn't already attached to the other end of the cord, solder it into place. Remember to observe the correct polarity; the tip of the lighter plug is positive and the sides are negative.

### SPRINGS

Converting a radio with spring contacts is often more difficult, because they're usually deep within the radio. (If your radio has springs that are accessible, treat them as if they were tabs.) To route power from your battery to the hard-to-reach springs, use the battery tray as a dummy.

Examine your battery tray, and find the two holes that are in the opposite end of the contact knobs. Next, feed the wire through the hatch cover and directly through the battery tray. Tie knots in the wire on the inside of the battery tray. Run the curly cord up to

(Continued on page 184)

# MASTER ERP ZAPPER

**E**VERYBODY WANTS an edge, and R/C racers are no exception. How many times have you spent an hour rebuilding your diff, adding hardened rings, carbide balls and super lube, all the while thinking that *this* diff will win the race for you? You spent all that time trying to gain an edge that might put you in the winners' circle.

Endurance Racing Products\* of Las Vegas, NV, has built a winning reputation. Dave Cleveland and his ERP crew have compiled a string of victories that are most impressive. According to ERP, much of their racing success can be attributed to the Master Zapper, a portable motor re-magnetizer.

The Master Zapper is a larger, AC version of the ERP Model 3000, ERP's DC-powered zapper. It took the 3000 from 15 to 20 minutes to zap a motor, but the Master Zapper can do the job in just a few seconds.



by ALEX  
STROUTHOPOULOS

## ANIMAL MAGNETISM

The Master Zapper is enclosed in a large aluminum box that has a grounded 6-foot power cord, a momentary rocker switch with a power-on light on the face of the unit and two rectangular, low-carbon steel bars on top. Each bar has

two cupped ends; one end of each bar has a motor-contact area of 1 inch, and the other end of each bar has a contact area of 1/2 inch. Depending on your application, you can pivot the bars to use the 1-inch cups or the 1/2-inch cups.

### GETTING STARTED

It's easy to use the Zapper, but you *must* read the instruction manual first! If you don't, you may destroy your motor. The Master Zapper is very powerful, so be careful: keep small objects away from the Zapper, because they might fly toward it when you turn it on; and be aware that people with pacemakers or hearing aids should stand at least 10 feet away when the Master

Zapper is on.

Before you start zapping, use a compass to determine which of the motor's magnets is the south magnet, and which is the north. When you find the correct orientation, put the motor into the 1-inch cups, making sure that the north magnet is facing the cup marked "positive" and that the motor-mounting holes are pointing straight up. Press the button for approximately 1 second while you rotate the armature to equalize both magnets (to make this easier, attach a pinion to the motor's shaft), and you've zapped your motor!

By using a combination of zaps with the 1-inch cup and the 1/2-inch cup, you can tune your motor to suit your track. For more rpm, place the motor in the 1/2-inch cup and rotate the can 45 degrees clockwise. For more torque, turn the motor slightly counterclockwise. Another technique that Cleveland recommends is the reverse zap. Put the motor into the 1/2-inch cups with the north magnet facing the cup marked "negative" and press the "on" button for a split second. This will

### NEWS FLASH: CEASE-FIRE FAILS!

Just when you thought that the new ROAR-mandated, 24-degree-timing rule would bring stock-class racing back to a contest of drivers rather than motors, things have changed.

What would happen if you re-centered your motor's magnetic field, in effect advancing the timing? With the Master Zapper and the 1-inch cups, you can demagnetize the magnets, turn the motor a few degrees to the right in the cups, and then re-zap the magnets off-center in the 1/2-inch cups. When they're re-zapped this way, the field centers are 75 degrees, rather than 90 degrees, from the motor-mounting holes.

Rotating the magnets' field centers a few degrees is equivalent to advancing the timing on a modified motor by rotating its endbell, and it's legal under current ROAR and NORRCA rules because it can't be detected. Unlike tweaking, where all you need is an Allen wrench and a pinion, changing the field centers requires a \$350 Master Zapper. According to Dave Cleveland, even if you do buy the equipment, only about 60 percent of motors are improved; the remaining 40 percent are ruined. Once again, the price of serious stock-class racing has increased.



# COMING NEXT MONTH!

## CAR OF THE YEAR

### FEATURES

**NR/CTPA Worlds!**  
**Novak Digi-Peak Plus**  
**Install Radio Gear**  
**Andy's Pro Race Kit**

### R/C RACER

**Car Action/Andy's  
Shootout II**

**All About  
Starter  
Boxes**

**Inside Joel  
Johnson's  
12LW** →



### TRACK REPORTS

**Kyosho 4Runner**  
**Mugen Super Sport**  
**Tamiya Nissan Skyline**  
**Kyosho Raider Pro**

### COLUMNS

**Nitro News**  
**Scoping Out**  
**Troubleshooting**  
**Truck Stop**

## MASTER ZAPPER

knock out a section of the motor's magnets, increasing either rpm or torque (depending on how you position the motor in the cups).

### TESTING THE ZAPPER

To test the Master Zapper's results, I used a Lavco\* Sport Dyno, which measures both rpm and power at three electronically controlled load settings. I tested a variety of stock motors—ranging from brand-new ones to nearly worn-out ones. I cleaned all the motors, zapped them with the 1-inch cup, re-zapped them with the 1/2-inch cup and then tested them on the Sport Dyno.

I found that the older motors had the greatest increase in rpm and power; on the newer motors, however, the results were inconclusive. With some motors, no performance increase was measured on the dyno, but I could feel that the mag-

nets were stronger when I spun the motor by hand. Out-of-the-box motors had a slight, unexpected *drop* in performance. Cleveland said, however, that new motors won't benefit from zapping until they've been run a few times. The zapper's primary function is to restore worn-out magnets.

The zapped motors that didn't register a measurable performance increase on the dyno *did* perform better on the track. Although their speed was the same, the motors accelerated out of the turns faster. I've found that zapping raises the motors' torque, providing more low-end punch. This isn't easy to read on a dyno, because dyno readings are taken not as a motor accelerates, but after it has reached top speed.

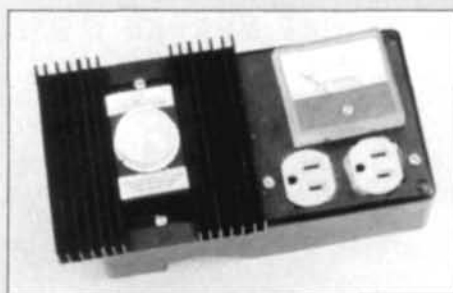
### EXPERIMENTATION

One thing that I like about the Master Zapper is that you can vary the zapping

(Continued on page 188)

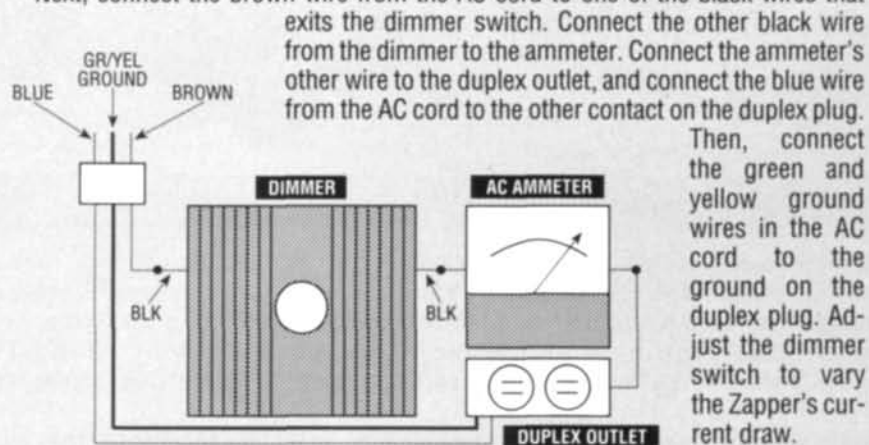
### POWER DOWN

One of the Master Zapper's "tricks" is the reverse zap. If you reverse-zap a motor's magnets, you can change how the motor runs. When you do this, however, it's important that you press the power button for only a split second, or your motor may go up in smoke when you run it. Dave Cleveland has created a simple unit that allows you to regulate the Zapper's power output. To make it, you'll need a Radio Shack 7<sup>3</sup>/<sub>4</sub> x 4<sup>3</sup>/<sub>8</sub> x 2<sup>3</sup>/<sub>8</sub>-inch project box (no. 270-232), a Leviton 1500W dimmer switch (no. 61500), a standard household duplex outlet, a Shuriter AC 15A ammeter, and a grounded AC power cord.



*This unit regulates the Master Zapper's power. It's useful when you reverse-zap; if you use too much power, you can damage your motor.*

The unit is easy to assemble. Cut holes in the Radio Shack box (it's made of soft plastic) and mount the dimmer switch, the ammeter and the duplex outlet.



# WHAT'S NEW

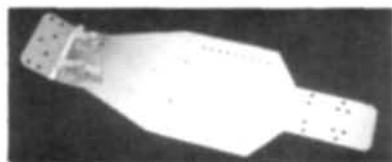


## HPI Wide Tread Hub

The Wide Tread RC10T and Kyosho truck hubs are designed for use with HPI's Super Star monster-truck wheels. The RC10T hubs increase the truck's track by 1.18 inches (0.59 inch on each side); those for Kyosho trucks increase it by 1.1 inches (0.55 inch on each side).

Part nos. 6165 (RC10T); 6170 (Kyosho trucks).

For more information, contact HPI, 22600-C Lambert St., Ste. 904, El Toro, CA 92630.



## SASSY CHASSIS RC10 Chassis & Bellcrank Steering

Made of aerospace-grade aluminum alloy (7075-T6), this chassis is 2.5 ounces lighter than stock tub chassis, and it's guaranteed not to break or bend under normal racing conditions. It comes with your choice of standard (no. 155) or balanced (no. 1501) aluminum bellcrank steering systems with bushings. You can bolt all the stock components directly onto it—no drilling or countersinking required. Optional bearings are also available for the steering systems. This chassis is great for RC10 truck conversions.

Part no. 9015-A

Price: \$49.95

For more information, contact Sassy Chassis, 906 Ridgewood Dr., Cary, IL 60013.



## MRC/TAMIYA Nissan Skyline

With a shaft-driven 4WD system powered by a 540-type motor, the sturdy Nissan Skyline GT-R Nismo is suitable for on- or off-road applications. Its rugged tub chassis holds all the electronics safely, and the car also features front and rear double-wishbone suspension and oil-filled, coil-over shocks.

For more information, contact MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.

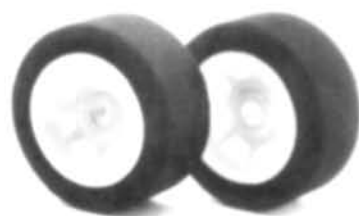


## TWISTER Scorpion Motors

Each of Twister's Scorpion stock motors features a slotted can, wet magnets, an ingenious, new, ultralight armature and Twister's powerful Pro Cut brushes. Owing to recent developments in copper technology, the modified Scorpions are extremely powerful, yet easy on your batteries.

Part nos. 3010 (44-degree stock); 3501 (44-degree Signature Series stock); 806 (24-degree stock); 2010 (11-turn triple for 2WD or 4WD); 2011 (12-turn triple for 2WD or 4WD); 2013 (13-turn triple truck motor); 3902 (11- and 12-turn doubles).

For more information, contact Twister Motors, 657 E. Arrow Hwy. #H, Glendora, CA 91740.



## HORIZON HOBBIES Dyna-Sport Tires

The new 1/10-scale on-road Dyna-Sport tires are designed for street use and club-level racing, where durability and "affordability" are important considerations. They last longer, because they're trued to a large 2.6-inch diameter. The included white, nylon, NASCAR-style rims make them look sharp, but Dyna-Sports will fit any American-made rim.

For more information, contact Horizon Hobby Distributors Inc., 3012 Clark Rd., P.O. Box 6029, Champaign, IL 61821.



## DAHM'S Warrior II

Dahm's exciting Warrior II racing body is designed to fit most 2WD off-road cars, including the RC10, the TQ10 and the RC10 graphite. Made of .030-inch-thick GE Lexan, it features low, aerodynamic styling, wide side pods with vents, a rear deck spoiler, ESC cooling vents and fine detailing. It comes with finishing instructions, window-masking templates, Dahm's decals and a super-fin wing.

Part nos. D170; D170P (painted).

Prices: \$17.98; \$29.98.

For more information, contact Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931.





### **KYOSHO Outlaw Raider**

Kyosho's Outlaw Raider captures the popularity of stadium-truck racing. Perfect for first-time modelers, the kit features long oil-filled shocks with maximum suspension travel for off-road surfaces, a heavy-duty speed controller, large pin-spoke tires, dish-style wheels and a flexible resin chassis.

Part no. KYOC0190

Price: \$149.95

For more information, contact Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826.



### **HOBBICO Multi Charger**

Eliminate the clutter with this affordable unit! Hobbico's Multi Charger can charge up to four batteries at once from just one AC outlet. You can adjust the current (from 10 to 500mAh) on each of its four outlets with the flick of a switch. It has an LED charge light at each color-coded outlet and fuse protection, so charging is fast and easy.

Part no. HCAP0100

Price: \$89.95

For more information, contact Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826.



### **TRINITY Monster Stock Jr.**

Trinity's new Monster Stock Jr. motor has a slotted short-stack armature, a fluorescent-pink can and an endbell with 4.9 wet magnets. The short stack requires less wire, and this reduces the motor's resistance, making it faster than a standard stock. Its timing has been set at 36 degrees, and although it isn't ROAR-legal, it has been submitted for NORRCA approval.

Part no. 1000

Price: \$28



### **Battery-Equalizer Discharge Board**

"Hard-discharging" is the best way to discharge your battery packs after a run but, when you do, there's always the possibility that the cells' polarity will be reversed. The Equalizer Discharge Board discharges each cell separately, and the pack can be left in for days without any cell reversal. The unit works with 4-, 6- and 7-cell packs. It comes as a kit, and assembly takes roughly 15 minutes. (Some soldering is required.)

Part no. RC 5900

Price: \$32.50

For more information, contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.



### **DAHM'S RACING BODIES 1992 Old Cutlass**

Dahm's aerodynamic '92 Olds Cutlass stock-car body fits 1/10-scale on-road race cars. (It's shown on an Associated RC10L.) Made of .030-inch-thick GE Lexan, it's light, and it features an adjustable bolt-on rear spoiler with mounting bolts; screened vents; hood and trunk pins; windshield clips; rear-window straps; and 3D intake vents on the side window.

Part no. D130

Price: \$19.98

For more information, contact Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931.



### **UNGAR Super Iron**

Unger's SL500 modular 50W soldering iron is powerful enough to liquefy half a pound of solder, so it's more than powerful enough for any R/C soldering job. It's AC powered, and it comes with a speedy 50W heater, a long, tapered chisel tip and a red handle that stays cool. Its modular design enables you to modify it to accept any of six tips and four heaters.

For more information, contact Horizon Hobby Distributors, 3102 Clark Rd., Champaign, IL 61821.

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For more information or to find your nearest dealer; contact Ken at S&K or send \$2.00 for a catalog. 215 S. Market St., Oskaloosa, Ia.

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## CLEVELAND CHAMPS

(Continued from page 154)

Piersol, who battled for 2nd. Decker drove clean and fast and ended up with a 36-lap run, which was followed by fast 35s from Piersol and Marshall.

On the Modified side, the weekend belonged to Joel "Magic" Johnson. Johnson, who came so close to winning in the last three years, showed a packed ballroom what he could do. With a screaming hole-shot off the pole, he drove brilliantly and economically, saving his batteries for the challenges he faced unsuccessfully in previous years.

Mike Ebert, who squeaked in a crowd-pleasing win in 1990, spent half the race within 2 or 3 seconds of Johnson, but after tapping a board or two, he became a dot in the Magic Man's rearview mirror and had to deal with constant challenges from Andy Dobson, Frank Calandra and Chris Doseck.

After Dobson hit a board at the halfway point, Doseck, who never really got hooked up until the Main, had 3rd pretty much sewn up, but he lost it when fate finally caught him. Driving flawlessly and working his way through the pack, he was well in range of Mike Ebert until the end. But right in front of the driver's stand, stuck to the carpet on an infield corner, was the villain—a stick-on wheel dot that had come off Doseck's car during one of the many shunts in the first half of the race.

The loss of that dot disqualified him and cost him 3rd place, but Doseck, who has matured so much in the last 12 months, hung on to the good-natured attitude he had displayed all weekend and was philosophical about his disqualification. "I've been using wheel covers for a long time, and I know I take a risk in doing it, but I believe it helps the car's speed and stability. This time, luck just wasn't with me. I guess that's how it goes." (Continued on page 184)



# PRO DYNO



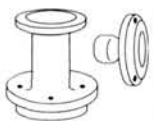
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## CLEVELAND CHAMPS

(Continued from page 174)

In 1990 at Cleveland, Doseck was a controversial figure, and many were watching him closely in '91. Well, folks, the 1991 model Chris Doseck is friendly, approachable and far more mature than last year's version.

When the Mains were over, Johnson's blistering 39-lap run had earned him 1st, 1990 Champ Ebert was 2nd and Calandra was 3rd.

### AWESOME ORGANIZING!

In the last three years, NORCAR has managed to shave almost six hours off the finishing time of the Indoor Champs. They've done this with tighter administra-

tion, faster, more accurate computers (and computer operators!), better transponders and top-quality volunteers. This year's event was definitely the most smoothly run of recent years. Organized by NORCAR co-directors Paul David and Glen Gabarik, who were assisted at the computer by Don Holub and Kay Shevchuk, the event started early, was hiccup-free and even finished early: the A-Main wrapped up before 3 p.m. on Sunday!

For pilgrims with planes to catch, it was time to set off for the airport. For many, it was a last chance to see the hobby displays, search out an autograph or two and compare notes on victories or defeats. For Alex Gombach, it represented a chance to put "these 80-year-old dogs of mine up for a

few minutes." For organizer Paul David, it was time for a quick sip of beer before he pulled a crew together to tear down the track. The 1991 Cleveland Indoor Champs was a terrific experience, and many will make the journey again. ■

## BATTERY PACK

(Continued from page 156)

the knobs at the other end of the tray, strip the wire, and solder it to the knobs. (Take care not to melt the battery tray!) Insert the tray and reattach the hatch cover as you would normally do. Always double-check the polarity before you make the final connection.

(Continued on page 186)

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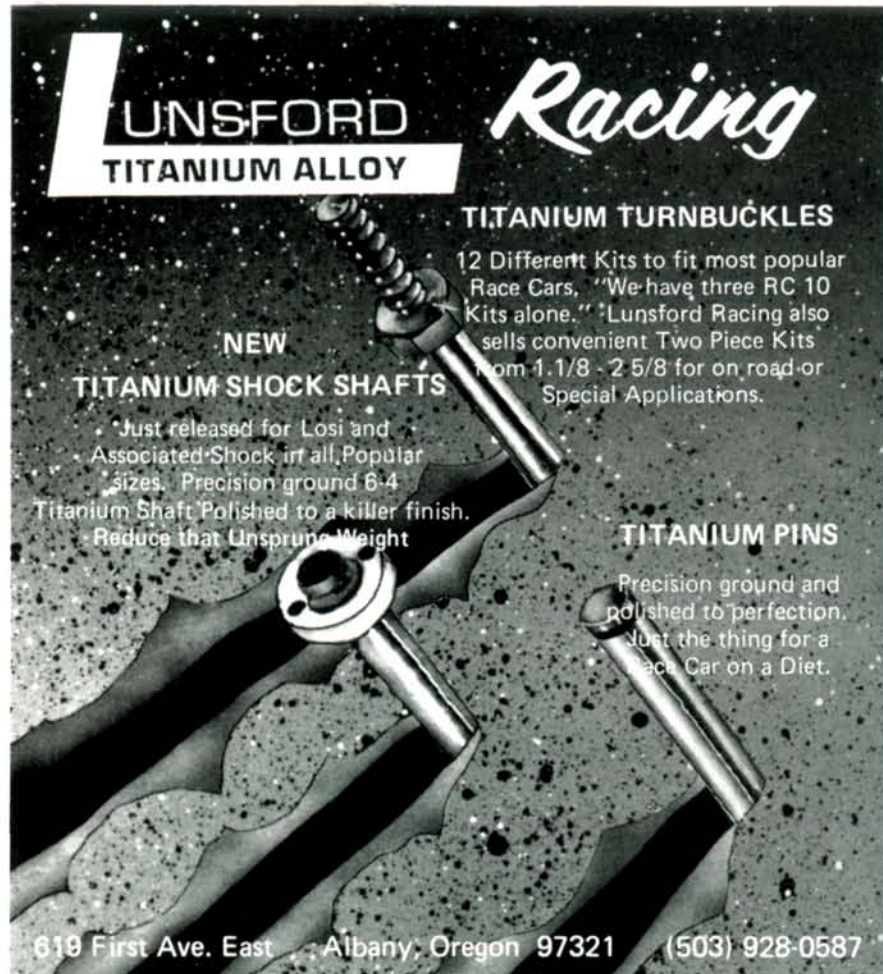
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## BATTERY PACK

(Continued from page 184)

### SPECIAL NOTES FOR AIRTRONICS AND KO RADIOS

Some Airtronics\* and KO\* radios have special plugs built into the battery compartment for the installation of optional Ni-Cd battery packs. These plugs may be hard to find, but check for them on your radio; they make the conversion a snap. Just put the appropriate connector on the curly cord and plug it in.

### FINAL ADVICE

Before you connect the radio to the battery, please re-check your polarity and look for possible shorts. Make sure that you've insulated all the exposed wire. When you're sure that everything works correctly, put your battery pack in a fanny pack, hang it from your belt, or carry it in a bag over your shoulder.

When you're all set, plug in the cord and flip your radio power switch. When you see the charge-indicator dial read "full" and stay there all day, I'm sure that you'll say goodbye to those costly AAs forever.

(Continued on page 188)

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## BATTERY PACK

(Continued from page 186)

\*Here are the addresses of the companies mentioned in this article:

**Tower Hobbies**, P.O. Box 9078, Champaign, IL 61826.

**Airtronics Inc.**, 11 Autry, Irvine, CA 92718.

**KO Propo**, distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.

## MASTER ZAPPER

(Continued from page 160)

techniques. You can use the 1-inch cup, the 1/2-inch cup, the standard zap and the reverse zap. You can also alter the magnets' field centers (see sidebar). If you reverse-zap a motor, and then rotate it in the cups so it's slightly off-center before you

re-zap it, you can achieve the same effect as a timing increase. The possibilities are endless!

### FINAL THOUGHTS

I found the Master Zapper to be a high-quality unit, but one question remained in my head whenever I used it: is it worth

(Continued on page 194)

# Finally, a line of accessories just for gas racers

Ever since the category of 1/8 scale gas racing was introduced, there has been a need for high quality, readily available hop-up items. Now DuraTrax is expanding their line to include a special category just for gas racers—in both the 1/8 scale, and even the new 1/10 scale categories. Here's just a sample of what you can find in the DuraTrax Gas Accessory Line:

For improved performance of your .21 engine, try the DuraTrax 1/8 scale Tuned Pipe (DTXC1000). You'll find increased power output and lower noise levels on your Kyosho Burns, Inferno and other 1/8 scale buggies, or USA-1 Nitro Crusher monster truck.

Quick starts at the track can mean the difference between 1st and 2nd place. The DuraTrax 1/8 Scale Starter Box (DTXP5000) makes getting started a fast, easy, one-man job.

DuraTrax Burns on-road tires (DTXC8236, DTXC8237) convert your Burns DX, Turbo Burns or Inferno into a mean street machine. They feature green compound foam rubber and come mounted and trued.

Kyosho Inferno chassis shown

### Hop-ups now available for 1/10 scale gas racers, too

The DuraTrax O.S. .12 CZ-R Engine Head (DTXC1500) provides cooler running for longer engine life, letting you get the best performance possible from your engine.

DuraTrax 1/10 Scale green compound foam tires (DTXC9800, DTXC9801) come mounted and trued and fit the Kyosho Rampage and gas-powered Corvette ZR-1.

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## MASTER ZAPPER

(Continued from page 188)

\$350? ERP's winning record is hard to refute, but can the Master Zapper make that much of a difference? Ultimately, it's your decision whether or not to drop the coin for this unit. All in all, I have to say that the Master Zapper is a very intriguing unit.

\*Here are the addresses of the companies mentioned in this article:

**Endurance Racing Products**, 826 N. Lamb, Las Vegas, NV 89110.

**Lavco USA**, 3150 E. La Palma, Unit B, Anaheim, CA 92806.

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